

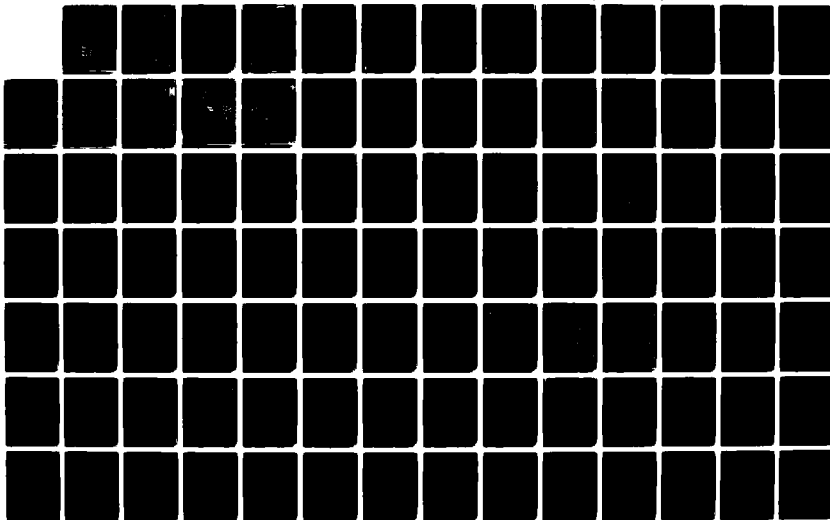
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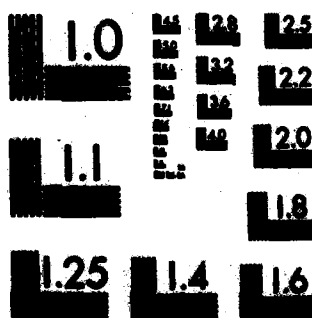
OPERATION AND MAINTENANCE SAVANNAH HARBOR GEORGIA(U)
ARMY ENGINEER DISTRICT SAVANNAH GA JAN 76

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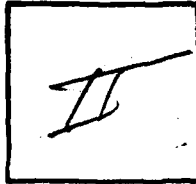


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FINAL
ENVIRONMENTAL STATEMENT

OPERATION AND MAINTENANCE
SAVANNAH HARBOR, GEORGIA

U.S. ARMY ENGINEER DISTRICT
SAVANNAH, GEORGIA
DECEMBER 1975

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2. SUMMARY

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17. ABSTRACT (include all words and phrases if necessary and possible)

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

SUMMARY

**OPERATION AND MAINTENANCE
SAVANNAH HARBOR, GEORGIA**

() DRAFT

(X) FINAL ENVIRONMENTAL STATEMENT

RESPONSIBLE OFFICE: District Engineer, Savannah District, U.S. Army Corps of Engineers, P. O. Box 889, Savannah, Georgia 31402 Phone No. (912) 233-8822

1. NAME OF ACTION: **(X) ADMINISTRATIVE** **() LEGISLATIVE**

2. DESCRIPTION OF ACTION: The removal of approximately 7 million cubic yards of material annually is necessary to maintain the authorized width and depth of the navigation channel. This operation requires the deposition of approximately six million cubic yards from the inner harbor in existing disposal areas and one million cubic yards from the bar channel in an open ocean disposal site.

3. (A.) ENVIRONMENTAL IMPACTS: Continuation of Savannah Harbor to accommodate ocean going vessels; maintain and improve safe navigation channel; continued use of port facilities and industrial plants within the harbor area; maintain and increase local, State and region-wide economic levels; improved control of channel velocities.

(B.) ADVERSE ENVIRONMENTAL IMPACTS: Temporary increase in turbidity and temporary loss of plankton and benthic organisms during dredging activities.

4. ALTERNATIVES TO THE PROPOSED ACTION:

- A. Recycle dredged sediments for construction and industrial products.
- B. Ocean dumping of dredged sediments.
- C. Use of other harbors.
- D. Cease all maintenance type dredging.

5. COMMENTS RECEIVED:

U.S. Department of Commerce
U.S. Department of Housing and Urban Development
U.S. Department of the Interior
U.S. Department of Transportation
U.S. Coast Guard
Federal Highway Administration
U.S. Environmental Protection Agency

FINAL
ENVIRONMENTAL STATEMENT
OPERATION AND MAINTENANCE
SAVANNAH HARBOR, GEORGIA

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Georgia Office of Planning and Budget
South Carolina State Clearinghouse
South Carolina Water Resources Commission
Chatham County - Savannah Metropolitan Planning Commission

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FINAL STATEMENT TO CEQ 30 January 1975

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OPERATION AND MAINTENANCE
SAVANNAH HARBOR, GEORGIA

1.00 Project Description.

1.01 Legislative history. Congressional authority for the operation and maintenance of Savannah Harbor dates back to 1829. Since that time, there have been numerous authorizations for the improvement and maintenance of the Savannah Harbor navigation channel. The current Savannah Harbor project was authorized by the River and Harbor Act of 2 March 1907, House Document 181, 59th Congress, as amended by several acts, the most recent amendment being the River and Harbor Act of 27 October 1955, House Document 226, 89th Congress.

1.02 Location. The Savannah Harbor entrance is 75 statute miles south of Charleston Harbor, South Carolina, and 120 statute miles north of Jacksonville Harbor, Florida. Savannah Harbor is a deep draft harbor comprised of 10.8 miles of channel across the bar to deep water in the Atlantic Ocean and the lower 21.3 miles of the Savannah River. With certain of its tributaries, the Savannah River forms the South Carolina-Georgia boundary. Miles referred to hereafter are miles above the mouth of the Savannah River unless otherwise designated.

1.03 Although Congressional authority for the development of Savannah Harbor dates back to 1829, the actual use of the harbor as a shipping port predates this some 96 years to 1733. In the intervening years, the channel has been widened and deepened, and groins, training walls, and a closure dam added. With each increase in depth and attempt to confine the channel, salinity intrusions progressed upstream, and shoaling problems became more acute.

1.04 Dimensions of the present day navigation channels and turning basins are as follows.

1.05 Channels. 40 feet deep and 600 feet wide from deep water in the ocean (mile 10.8B) to the entrance to the channel between the jetties (mile 2.6B); thence 38 feet deep and 500 feet wide to the harbor entrance (mile 0.0).

38 feet deep and 500 feet wide, with necessary wideners at the bends, from mile 0.0 to the upstream end of Fig Island turning basin (mile 13.3).

38 feet deep and 400 feet wide from mile 13.3 to the upstream end of Kings Island turning basin (mile 18.9).

36 feet deep and 400 feet wide from mile 18.9 to the upstream end of Argyle Island turning basin (mile 19.9).

30 feet deep and 200 feet wide from mile 19.9 to the upstream limit of the project (mile 21.3).

1.06 Turning basins. Port Wentworth and Argyle Island turning basins; 600 feet wide, 600 feet long, and 30 feet deep.

Kings Island, Marsh Island, and Fig Island turning basins: 900 feet wide, 1,000 feet long, and 34 feet deep. (Kings Island turning basin was widened from 900 feet to 980 feet in October 1973 under maintenance authority.)

LASH turning basin (Maintenance is done by the Georgia Ports Authority.), located at the harbor entrance just below Fort Pulaski National Monument: 1,050 feet wide, 1,200 feet long and 40 feet deep. (Dredged material is deposited on Oysterbed Island.)

1.07 Additional harbor improvements also provide for sediment control works consisting of a tidegate structure across Back River; a sediment basin 40 feet deep, 600 feet wide, and 2 miles long with an entrance channel 38 to 40 feet deep and 300 feet wide; a drainage canal 15 feet deep and 300 feet wide across Argyle Island; control works and canals for supplying fresh water to the Savannah National Wildlife Refuge; and fresh-water facilities to mitigate damages to areas other than refuge lands. The harbor navigation facilities are presented in Plate 1.

1.08 Project details. The primary objective of the maintenance program for the Savannah Harbor is the removal and disposal of approximately 7 million cubic yards of sediments annually deposited in the navigation channel. This operation requires the deposition of approximately 6 million cubic yards from the inner channel and 1 million cubic yards from the bar channel. (See Graph I - Shoaling Graph, page 4).

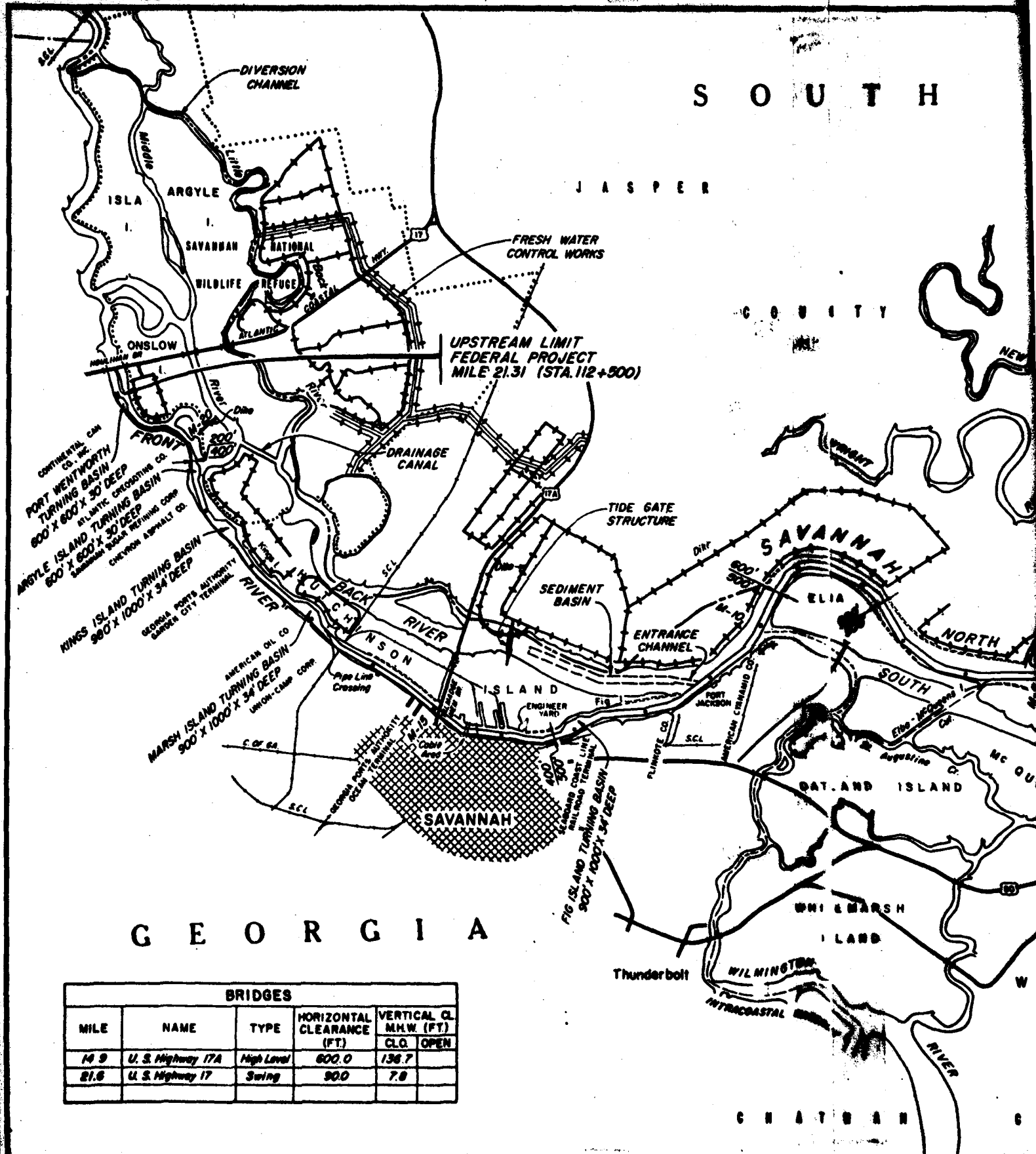
1.09 Dredging of the inner harbor is performed by hydraulic pipeline dredges (Government owned and contract). Maintenance of Savannah Harbor is a year-round operation which is made necessary because of continuous shoaling of the project channel. Maintenance dredging is necessary in the total project channel--an area of 1,162 acres and five turning basins--a total area of 68 acres for a grand total of 1,230 acres.

1.10 The potential capacity of the existing disposal areas in the upper harbor above station 80 is adequate for about 40 years, but is dependent on the acquisition of a long-term easement for Area 2-A beyond the expiration date of 1976. The following approved disposal sites with acreages are available for dredge disposal in the upper harbor. Areas 1-A, 1-B and Argyle Island are located on areas of the Savannah National Wildlife Refuge which are not managed for wildlife. The Refuge is owned by the U.S. Department of the Interior.

<u>Area</u>	<u>Acres</u>
1-A	158
1-B	86
Argyle Island	298
2-A	<u>350</u>
Total	892

(See Disposal Plan Map, Plate 2)

CORPS OF ENGINEERS



C A R O L I N A

SEA FORT COUNTY

HILTON

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DAUFUSKIE

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CALIBOGUE

O C E A N

JONES

ISLAND

TURTLE

ISLAND

RIVER CHANNEL

CHANNEL

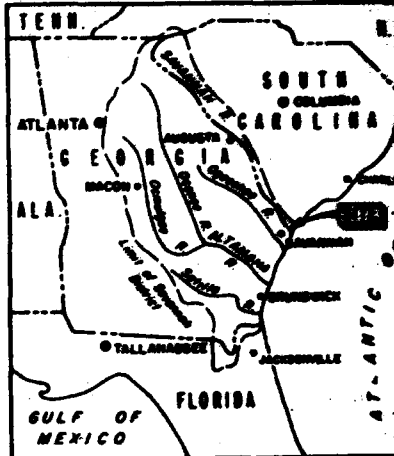
ISLAND

TYBEE

ISLAND

LITTLE TYBEE

ISLAND



NOTE:

Zero mile is Station 0+000 (West of Ft. Pulaski) mouth of Savannah River

UNDER CONSTR. - 40' DEPTH
COMPLETE - 36' DEPTH

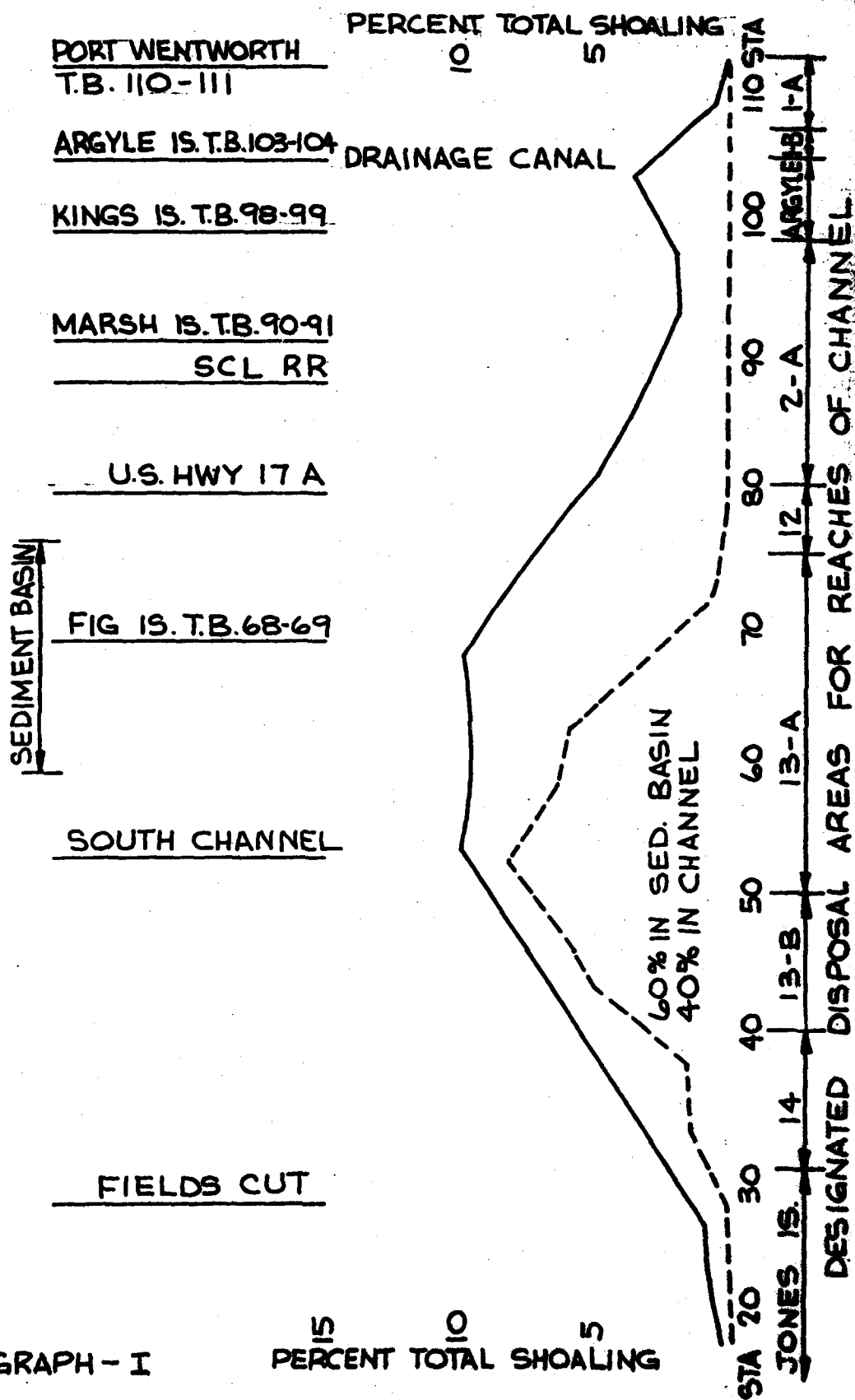
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PREPARED JUNE 1978

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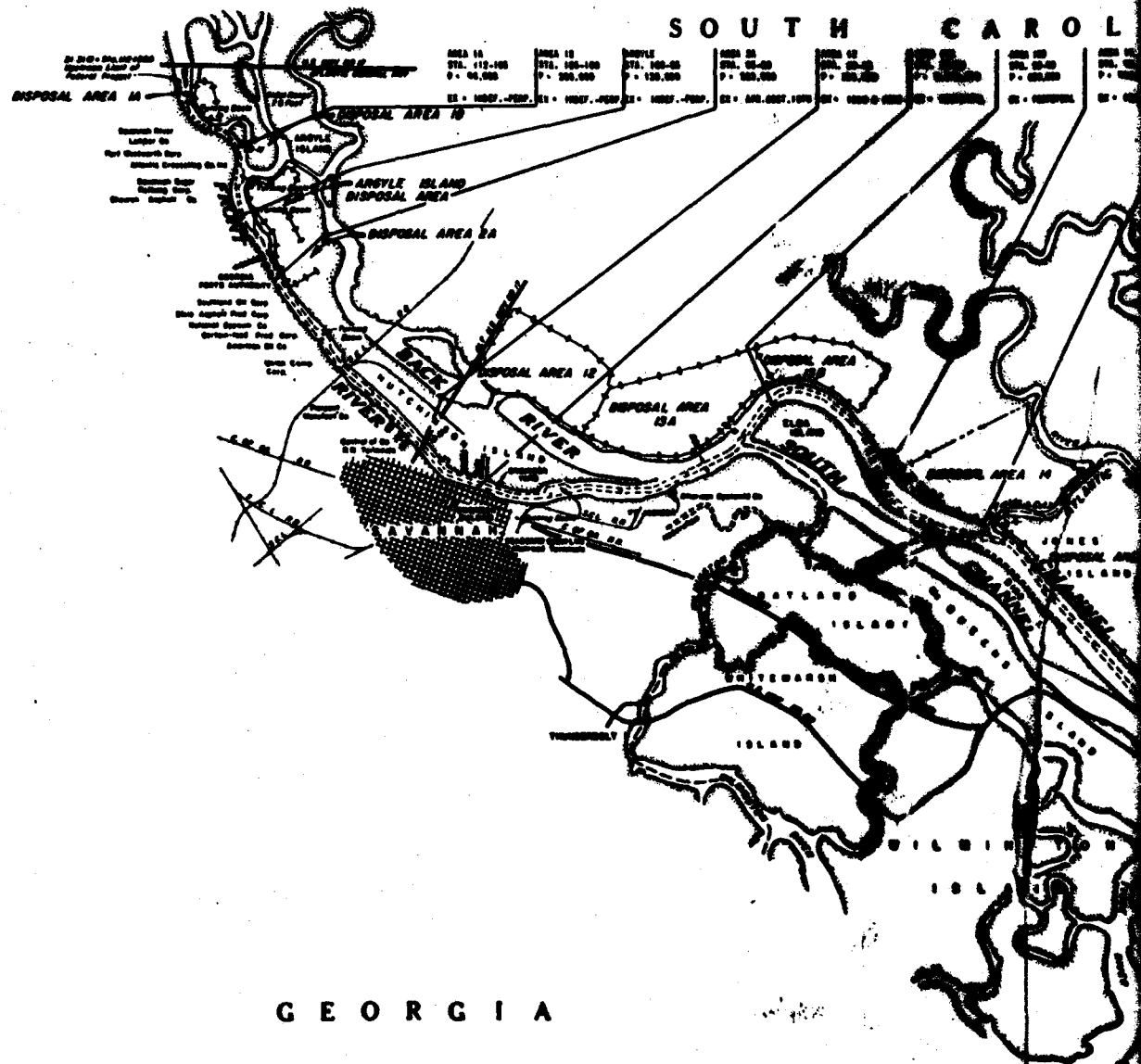
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CORPS OF ENGINEERS
SAVANNAH, GEORGIA

GRAPH - I



SAVANNAH HARBOR
SHOALING CHARTS

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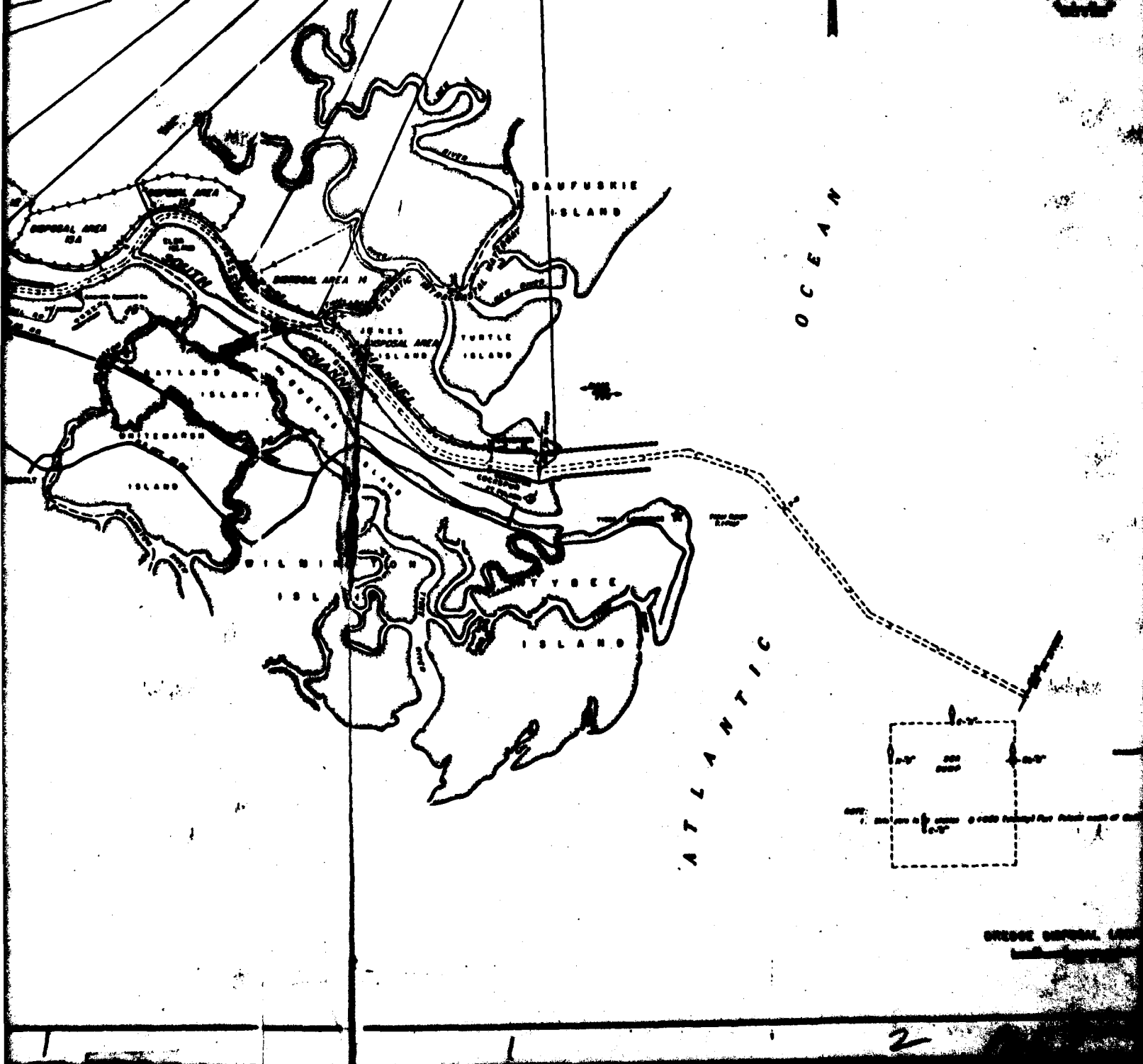
SOUTH CAROLINA

AREA 1 100-100 100-100	AREA 2 100-100 100-100	AREA 3 100-100 100-100	AREA 4 100-100 100-100	AREA 5 100-100 100-100	AREA 6 100-100 100-100	AREA 7 100-100 100-100	AREA 8 100-100 100-100
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NOTE:
 "P" INDICATES PRESENT DISPOSAL DATE FOR TONS & TONS.
 "T" INDICATES TYPICAL DATE OF DISCOVERY.



VICINITY MAP



ORANGE DISPOSAL AREA

1.11 Approximately 60 percent of the shoaling in the inner harbor occurs in the 7-1/2 miles of navigation channel between stations 80 and 40 adjacent to the City of Savannah. The following approved sites, adjoining Back River in South Carolina, are available for this reach of the channel.

<u>Area</u>	<u>Acres</u>
12	1,260
13-A	1,500
13-B	700
Total	3,460

1.12 It has been estimated that this area of 3,460 acres is adequate, with the raising of the existing dikes, to the year 2,000. Beyond this time, to adequately maintain the channel between stations 40 and 80, additional disposal methods or sites will be required.

1.13 Located in the lower channel between stations 40 and 0 (Fort Pulaski), are two approved sites, each with an estimated capacity to meet the disposal requirements for 100 years at the present shoaling rates. These sites, designated as 14 and Jones-Oysterbed Island contain 1,800 acres and 2,900 acres, respectively.

1.14 Regular maintenance is normally performed on all existing dikes. The dikes on Areas 12, 13-A, 13-B, Argyle Island and 2A have recently been raised.

1.15 From Fort Pulaski (station 0) to the ocean bar, a distance of 10.8 miles, the channel is maintained by hopper dredge and sediments are deposited in an Environmental Protection Agency approved ocean site. The ocean site is approximately four square miles in area, 20 to 36 feet in depth, and located at latitude 31°57' and longitude 80°46'.

1.16 Construction and maintenance of retaining dikes and the procurement of new disposal areas are the responsibility of the project sponsors, the Commissioners of Chatham County, Georgia, and the Georgia Ports Authority.

1.17 Project benefits. The tonnage of raw materials and manufactured products passing through the Port of Savannah increased from 4,157,537 tons in 1964 to 9,698,679 tons in 1974. The maintenance of the harbor navigation channel is absolutely essential in continuing this bulk movement of goods and materials on which so much of the economic well being of the Savannah River Basin and adjacent areas is dependent.

1.18 Port accommodations, such as turning basins, slips, docking berths, warehouses, loading and unloading facilities and other features, are all of economic importance to the area and their usefulness is directly dependent on the maintenance of an adequate deep draft navigation channel. Other benefits include savings to shippers by eliminating delays of vessel

movements within the harbor, more expedient use of standby labor and demurrage to vessels using the upper harbor, increased utilization of larger tankers and bulk-cargo carriers, and overall improvement in harbor safety.

2.00 Environmental Setting Without the Project.

2.01 Savannah Harbor Channel. Savannah Harbor is a deep draft harbor comprised of 10.8 miles of channel across the bar to deep water in the Atlantic Ocean and the lower 21.3 miles of the Savannah River. With certain of its tributaries, the Savannah River forms the South Carolina-Georgia boundary. Miles referred to hereafter are miles above the mouth of the Savannah River unless otherwise designated. Dimensions of the present-day navigation channels and turning basins are presented in Section 1.00; the dimensions of harbor facilities are presented in Plate 1.

2.02 Additional harbor improvements also provide for sediment control works consisting of a tidegate structure across Back River; a sediment basin 40 feet deep, 600 feet wide, and 2 miles long with an entrance channel 38 to 40 feet deep and 300 feet wide; a drainage canal 15 feet deep and 300 feet wide across Argyle Island; control works and canals for supplying fresh water to the Savannah National Wildlife Refuge; and fresh-water facilities to mitigate damages to areas other than refuge lands. The Final Environmental Statement for the Savannah Harbor Sediment Basin Project was filed with CEQ on 12 March 1975.

2.03 The Final Environmental Statement for the Widening and Deepening of Savannah Harbor was prepared and coordinated with Federal, State and local organizations and was filed with CEQ on 7 January 1975. At the present time, there is a proposal under study to enlarge the Kings Island turning basin; to construct a turning basin adjacent to Elba Island; and to incorporate the Georgia Ports Authority's LASH (Lighter Aboard Ship) turning basin adjacent to Cockspur Island as an element of the existing Federal navigation project for Savannah Harbor. A Draft Environmental Statement on this recommended plan of improvement was filed with CEQ on 25 February 1975.

2.04 Savannah River, within the harbor limits, is generally divided into two channels by a series of interconnecting islands. From the Atlantic Ocean to mile 10, where the river converges, the harbor is separated into South and North Channels. Within this area, the navigational channel is maintained in the North Channel. After divergence of the river into Front and Back Rivers at mile 11, the navigational channel is maintained in Front River to the upper limits of the harbor at mile 21.3.

2.05 Approximately 6 miles above the harbor mouth, the Atlantic Intra-coastal Waterway crosses the harbor navigation channel. An existing barge channel 9 feet deep and 90 feet wide extends from the upper limits of the harbor up the Savannah River to mile 202.6 at Augusta, Georgia.

2.06 Shoaling in the inner Savannah Harbor requires the removal of approximately 6,000,000 cubic yards of sediments annually. This material is deposited in existing disposal areas. An additional 1,000,000 cubic yards

are removed from the bar channel. Project harbor improvements are not expected to result in any significant change in either the amount or the location of these sediments.

2.07 Climate. The climate of the Savannah Harbor area is characterized by long, moderately hot summers and short, mild winters. The area has an annual frost-free growing season averaging 280 days. Temperature and precipitation information based upon 40-year data collected at the U.S. Department of Agriculture Plant Introduction Station, Savannah, is presented in Table 1. The mild winter period, November through April, has an average temperature of 55.7 degrees Fahrenheit and the summer period, May through October, has an average temperature of 75.6 degrees Fahrenheit. Mean monthly rainfall is 4.23 inches with the heaviest precipitation occurring between June and September.

2.08 Channel sediments. Materials excavated from the Savannah Harbor can be divided into three distinct groups. The first group, consisting of sediments composed of broken shells, gravel, and coarse to very fine sand, is typical of the materials found between the ocean bar and the jetties.

2.09 Materials found between the jetties and Kings Island embrace the second group. These sediments are largely deposits of silts, soft blue clays, gravels and coarse to fine sands. The third group of sediments is found between Kings Island and the upper limit of the harbor. These materials consist of hardened and compacted silts, sands, clays, and mica. This is the only reach within the harbor where compacted materials are encountered.

2.10 The sources and the amount of sediment being introduced into the inner harbor are as follows: 3,000,000 cubic yards comes down the Savannah River from upstream; 2,000,000 cubic yards comes from the surrounding area; and 1,000,000 comes from the ocean. In addition, 1,000,000 cubic yards are removed from the bar channel.

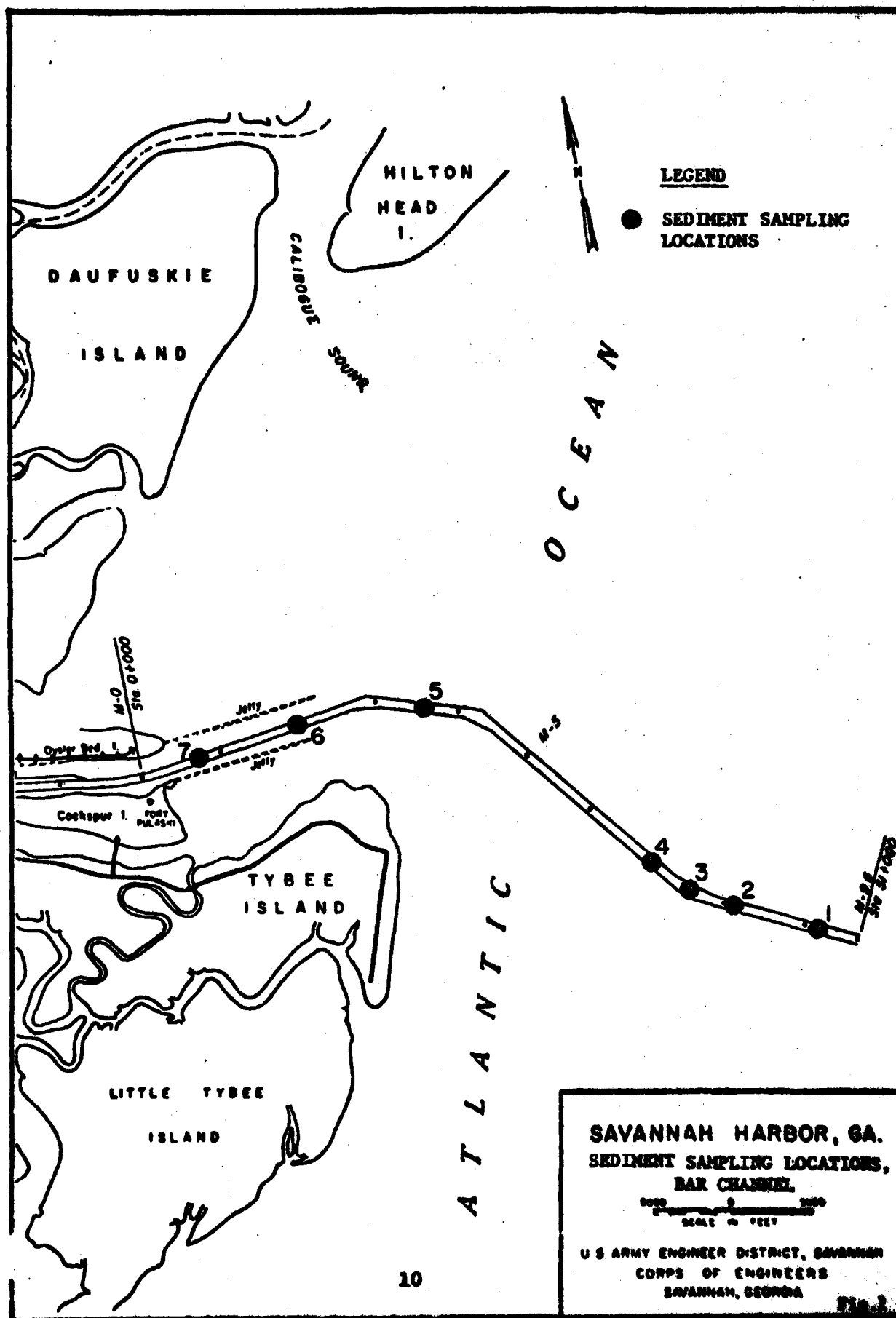
2.11 Figure 1, page 10, presents the sediment size sampling locations for the outer harbor. Appendix A presents a few representative gradation curves of sediments in the bar channel. Additional data are available from the files of the District Engineer.

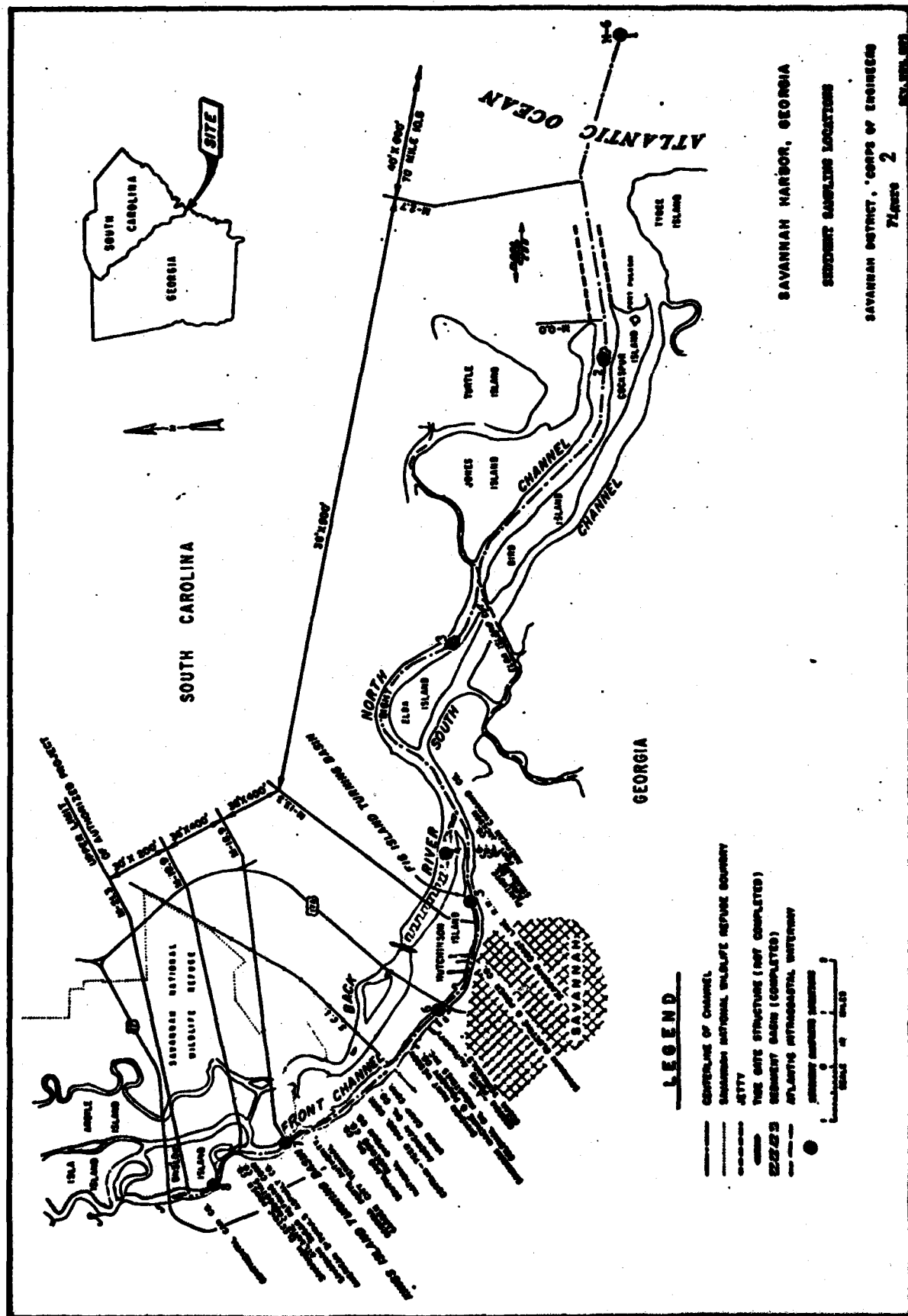
2.12 The environmental aspect of dredging in the proposed project area which may lead to possible ecological damages is the water quality impairment of the surrounding water during the dredging operations. To evaluate the impact of dredging on the impairment of water quality, chemical analyses and the standard elutriate test were made on the sediments and water samples collected in the project area (see Figure 2 for sample locations and Tables 2 and 3 for the chemical analyses of sediments and the standard elutriate test, respectively). The chemical analyses of the sediment samples taken from locations 1 through 6 inclusive, indicated that chemical constituents exceed the Environmental Protection Agency's (EPA) "Criteria for Determining Acceptability of Dredged

TABLE 1
NORMAL TEMPERATURES AND PRECIPITATIONS* FOR
U.S. PLANT INTRODUCTION STATION
SAVANNAH, GEORGIA

Month	Temperatures °F	Precipitation (Inches)
January	51.4	2.94
February	52.4	3.42
March	58.4	3.66
April	64.5	2.83
May	71.6	3.16
June	78.5	6.52
July	80.6	7.47
August	81.9	6.65
September	76.5	7.10
October	66.5	2.49
November	56.6	1.76
December	50.8	2.79
TOTAL		50.79
MEAN	65.8	4.23

*Temperatures and precipitations based on 40 years data. (1931 to 1970)





THE SOUTH ATLANTIC

ADVANCED CONCEPTS IN CONCRETE

THE UNIVERSITY OF CHICAGO

TABLE 3

SAVANNAH HARBOR, GEORGIA

ELUTRIATE TEST RESULT

Station Number	Total K		Hg (ppb)		Pb (ppb)		Zn (ppb)	
	Nitrogen (ppm)		Conc. in After		Conc. in After		Conc. in After	
	Water	Mixing	Water	Ratio*	Water	Ratio*	Water	Ratio*
1	0.06	0.40	0.7	0.01	0.02	0.2	0.3	0.1
2	0.20	0.25	0.1	0.02	0.02	0.1	0.6	0.1
3	0.30	0.40	0.1	0.02	0.02	0.1	0.1	0.6
4	0.30	1.95	0.6	0.03	0.03	0.1	0.3	0.1
5	0.30	1.40	0.4	0.02	0.03	0.1	0.4	0.1
6	0.65	1.60	0.2	0.04	0.05	0.1	0.6	0.1
7	0.62	0.68	0.1	0.01	0.02	0.2	1.0	0.1
8	0.50	0.70	0.1	0.01	0.02	0.2	0.3	0.1

*Ratio after allowing for 10 Fold Dilution.

Samples Collected 21 September 1975
 Samples Analyzed 22 Sept. - 4 Oct. 1975

Spoil Disposal to the Nation's Waters" in one or more of the parameters tested. However, none of the samples taken in the project area failed the elutriate test after an application of a factor of 10 dilution, as prescribed in Section 230.4-3, Federal Register, Vol. 40, No. 88, May 6, 1975.

2.13 Hydrology. Tidal fluctuations within Savannah Harbor are semidiurnal, averaging 6.9 feet at the mouth of the harbor and 7.9 feet at mile 21.3, with tidal influences extending upriver approximately 45 miles to the vicinity of Ebenezer Landing, Georgia. Maximum velocities encountered in the navigation channel approach 4 feet per second on floodtide and 5 feet per second on ebbtide.

2.14 Fresh-water inflow into the Savannah River at mile 61 near Clyo, Georgia, since 1962, has averaged 11,600 cubic feet per second (cfs), with maximum and minimum annual mean discharges of 20,900 cfs and 9,820 cfs, respectively.

2.15 The extent of salt-water intrusion in Savannah Harbor varies with the tidal stage and amount of fresh-water flow in the river. Salinity values from Highway 17 bridge obtained from EPA for the years 1958-1968 ranged from .03 to 11.38 ppt (228 observations) with a mean of .13 ppt. Only six observations exceeded .21 ppt during this time.

2.16 Ground water. The ground water supply in the Savannah area is available from two sources--a relatively shallow ground-water table and a deeper artesian aquifer. The majority of the water supply for domestic and industrial use is obtained from the deeper artesian aquifer in the Savannah area. River water and the shallow ground-water table are prevented from entering the artesian aquifer by an impermeable bed of silts and clays (aquiclude) 150-200 feet thick overlying the artesian aquifer.

2.17 Water quality. Prior to 1971, the harbor waters were degraded by untreated and treated domestic, industrial, and marine discharges. Since then, however, numerous changes and enforcement of Federal and State water quality standards, improved abatement measures by municipal and industrial sources, and public awareness have considerably improved the water quality throughout the entire harbor reach of the Savannah River.

2.18 The State of Georgia, Department of Natural Resources, has classified the various reaches of the Savannah Harbor for the following uses:

- | | | |
|----------------|---|---|
| Drinking water | - | U.S. Highway 17 Bridge (mile 22) upstream to mile 129 |
| Navigation | - | U.S. Highway 17 Bridge (mile 22) to Fields Cut (mile 5) |
| Fishing | - | Fields Cut (mile 5) to Fort Pulaski (mile 0) |
| Recreation | - | Fort Pulaski (mile 0) to the Open Sea and littoral waters of Tybee Island |

The State of Georgia water quality criteria for the above stream classifications are shown in Appendix B.

2.19 The Georgia Department of Natural Resources has a routine chemical monitoring station located on U.S. Highway 17 (mile 21.6). U.S. Highway 17 is upstream from all major municipal and industrial discharges in the Savannah area. The waters at this station were of slightly lower quality than those upstream at Clyo. Nutrients, although low, were elevated above background levels. Very little organic or oxygen-demanding materials were present. Fecal coliform densities ranged from low to moderate. The maximum one-time coliform density of 4,000/100 ml was exceeded for three of the ten samples taken. Dissolved oxygen concentrations during the warm weather months were higher than during the previous year. There were no other changes. The over-all water quality has improved slightly.

2.20 The routine chemical monitoring station at Fort Jackson (mile 11) is downstream from most wastewater sources in the area and is near the oxygen sag point. The Savannah River at Fort Jackson was degraded. There were no significant changes from the previous year. Water quality data (Environmental Protection Division, 1975) from U.S. Highway 17 (mile 21.6) to Crossing Range near buoy R28 (mile 2.2) of the Savannah River is included in Appendix C.

2.21 Economic environment. The principal area served by Savannah Harbor comprises the State of Georgia and adjoining sections of North and South Carolina, northern Florida, and eastern Alabama. The 1970 population of this area was about 5.5 million, of which 187,816 were in Chatham County and 118,349 in the City of Savannah. The July 1974 estimate of the population of Chatham County was 175,400, while the July 1973 estimate for Savannah was 105,768. The Savannah metropolitan area is the primary industrial user of the harbor and within this region more than industrial plants are engaged in the manufacture and production of a wide variety of products including asphalt, roofing materials, fertilizers, vegetable oils, paints, refined sugar, paper and pulp, gypsum, and lumber.

2.22 Deepwater terminals within Savannah Harbor are operated by the Georgia Ports Authority, Georgia International Trading Corporation, and the Seaboard Coast Line Railroad Company. The largest and most modern facilities on the South Atlantic Coast are located in Savannah and are owned by the Georgia Ports Authority. The Garden City Terminal has two bulk liquid berths, seven general cargo berths, two container berths, and over 3 million square feet of warehousing. The Ocean Terminal in downtown Savannah has 12 general cargo berths and 356,000 square feet of warehousing. Also, a LASH (Lighter Aboard Ship) facility with barge-marshaling area is now in operation in the lower reaches of the harbor near Oysterbed Island. Combined facilities of the Seaboard Coast Line Railroad Company and the Georgia International Trading Corporation provide the port with an additional 10 berths and over 400,000 square feet of storage space. A liquified natural gas (LNG) facility on Elba Island is nearing completion.

2.23 Revenue tonnage passing through the port in 1974 exceeded \$100 million and it is estimated that this type of revenue generates an economic impact approximately three times its original value in the local economy. Port facilities combined with industrial interests, which are dependent upon shipping activities, provide employment opportunities for 10,000 people within the Savannah metropolitan area.

2.24 Principal imports, exports, and respective tonnages for 1974 are presented in Table 4.

2.25 Noise. Noise pollution is not a serious problem within the project area and is no greater than that which would normally be expected in a metropolitan area. Distracting disturbances created by vehicular traffic, industrial activities, vessel signals, and aviation activities occur only at infrequent intervals.

2.26 Air quality. The control of air pollution is set forth in the Rules and Regulations of Air Quality Control, Georgia Department of Natural Resources. Air quality in the project area is being monitored and must meet the National secondary ambient air quality standards, as set forth by the Environmental Protection Agency pursuant to the Clean Air Act, as amended, except in some isolated areas. These standards are set for six pollutants: Sulfur oxides, particulate matter, carbon monoxide, photochemical oxidants, hydrocarbons, and nitrogen dioxide. The standards for secondary ambient air quality are of the highest and represent air quality requisites to protect the public welfare from any known or anticipated adverse effects associated with the presence of air pollutants. State and Federal ambient air standards for sulfur dioxide were met in 1974. However, the State standard for SO_2 of 229 ug/m^3 for 24 hours was exceeded on 26 December 1974. In addition, the State standard of 60 ug/m^3 annual geometric mean for particulates was exceeded at two sites in the Savannah area.

2.27 Major industries in the Savannah Harbor area have made necessary changes in the design of their plants to meet the air quality standards. As a result of these changes, possible visibility problems for harbor traffic and discomfort to personnel during atmospheric conditions resulting from stack emission of particulates have been minimized.

2.28 Wildlife resources. In 1931, the U.S. Fish and Wildlife Service established the Savannah National Wildlife Refuge encompassing 13,000 acres of once-cultivated lowlands and marshes along the northern bank of the lower Savannah River. The Refuge is located within the extremities of the Atlantic Flyway and provides an important nesting area for the wood duck. Since its establishment, approximately 3,000 acres of old rice-fields have been impounded, thus providing ideal resting and feeding areas for many thousands of migratory waterfowl each year.

2.29 The U.S. Fish and Wildlife Service has recorded over 224 species of birds on the Refuge, of which eighty-three species are known to nest locally. Four endangered or rare species, the brown pelican (Pelecanus occidentalis), southern bald eagle (Haliaeetus leucocephalus leucocephalus), American peregrine falcon (Falco peregrinus anatum), and red-cockaded woodpecker (Dendrocopos borealis) are transient to the Refuge and general area.

2.30 A few of the primary waterfowl utilizing the Refuge include: wood duck, mallard duck, ring-necked duck, blue-winged teal, widgeon and pintail. Other game birds include the coots, gallinules and snow geese.

TABLE 4
LARGEST EXPORTS AND IMPORTS
AT THE PORT OF SAVANNAH, GEORGIA, IN 1974

Commodity Code	Export Commodity	Short Tons
1451	Clay (Kaolin)	656,266
2611	Pulp	355,281
2631	Paper and Paperboard	286,088
2861	Gum and Wood Chemicals	86,630
0119	Oilseeds, NEC	65,740
2091	Vegetable Oils, Marg., Short.	63,122
3511	Machinery (Ex. Electrical)	60,640
2049	Grain Mill Products, NEC	53,470
2099	Misc. Food Products	45,069
4024	Paper Waste and Scrap	40,956
2819	Basic Chemicals and Products	34,887
4011	Iron and Steel Scrap	29,686
2211	Basic Textile Products	26,295
2821	Plastic Materials	16,137
3411	Fabricated Metal Products	13,663
3711	Motor Vehicles, Parts, Equip.	13,097
2421	Lumber	10,732
TOTAL EXPORTS		1,981,240
Import		
Commodity		
2915	Residual Fuel Oil	1,095,297
1311	Crude Petroleum	913,095
1411	Limestone (Gypsum)	628,521
3313	Coke, Pet. Asphalts, Solvents	260,611
2211	Basic Textile Products	176,289
3315	Iron, Steel Shapes, Ex. Sheet	174,232
1091	Nonferrous Ores	96,051
2431	Veneer, Plywood, Worked Wood	83,196
3316	Iron and Steel Plates, Sheets	74,291
2914	Distillate Fuel Oil	70,906
2061	Sugar	56,735
3411	Fabricated Metal Products	54,173
3241	Building Cement	53,125
2879	Fertilizer and Materials, NEC	37,854
3511	Machinery, Ex. Electrical	36,853
1051	Aluminum Ores	36,128
2819	Basic Chemicals and Prod., NEC	36,113
TOTAL IMPORTS		4,251,970

SOURCE: Waterborne Commerce of the United States, 1974

Species of migratory birds, other than waterfowl, that regularly use the Refuge in large numbers are: Piedbilled grebe, great blue heron, little blue heron, common egret, least bittern, king rail, cattle egret, white ibis, spotted sandpiper, solitary sandpiper, common snipe, ring-billed gull, American bittern and black tern.

2.31 The American alligator, an endangered species, is abundant on the Refuge as are various other species of reptiles and amphibians.

2.32 White-tailed deer, an important game animal in the southeast, inhabit the higher terrain of the Refuge and surrounding area along with rabbits, raccoons, opossums, squirrel, gray fox, bobcat and several other species of small mammals.

2.33 The habitat to support this wide diversity of wildlife is provided by more than 900 species of plants and several distinct ecological units within the Refuge. Described here are only a few of the more common botanical species inhabiting the various ecological units. Managed pools: white waterlilies, bladderworts, pickerelweed, water hyacinth. Tidal marshes: Peltandra, sawgrass and smooth cordgrass. Wetlands: bald cypress, sweet gum, red maple and cattail. Terrestrial: pine, hickory and oak.

2.34 Public waterfowl hunting is permitted on approximately 3,000 acres of river marsh between Front and Back Rivers and nonconsumptive activities such as sightseeing, bird-watching and nature studies are encouraged. A nature trail provides an all-season opportunity for the visitor to glimpse the Refuge's natural beauty and wildlife.

2.35 Many miles of drainage and irrigation canals along with several pools are open for public fishing from March to October on the Refuge. Principal species taken include blue-gill, crappie and largemouth bass. Land-locked flounder and striped bass are caught in one pool while along the river, such species as redbreast, blue-gill and catfish are the principal species taken. (See Appendix D for a more complete listing of biota.)

2.36 Aquatic resources. Wetland areas play a very important role in wildlife conservation, not only for waterfowl, but also for other species of wildlife. Salt water marshes are an integral component of the estuarine intertidal and adjacent shallow-water zones. These zones are the most productive, and hence most important, parts of the estuarine nursery grounds. They are considered by many to be extremely critical habitats—harboring, nourishing, and producing an exceptional array of vertebrate and invertebrate fauna. While waterfowl are the most obvious occupants of this habitat, one must not overlook the fact that the young growth stages of many important commercial and sport fishes species are dependent upon the nursery grounds for food and protection.

2.37 The vegetation of the Savannah Harbor complex is varied with smooth cordgrass (Spartina alterniflora) the predominate species in the salt marshes of the lower reaches of the harbor. As one goes up the Savannah

River, the marsh vegetation gradually changes from predominately salt marsh species to a mixture of brackish and fresh water species. This zone of transition is characterized by the presence of many of the salt marsh grasses, but with a much greater diversity of vegetation. Black needle rush (Juncus roemerianus) is commonly found in the marshes. However, though abundant, it is considered to be the least important of the common marsh grasses as it is usually associated with the high fringe areas located above mean high tide.

2.38 The biotic community of the Savannah River estuary may be divided into three major groups, planktonic, benthic and nektonic. The planktonic community is composed of algae, diatoms, copepods, cladocerans, rotifers, molluscs, insects, polychaetes and other invertebrates (Rees, 1972).

2.39 Rees, R. A. (1972) reported that the Savannah River, in the vicinity of Port Wentworth, Georgia (upstream from the proposed Kings Island turning basin), was rich and abundant in benthic fauna in 15 feet of water on a mud-flat substrate. Polychaete and oligochaete worms constituted 28 to 53 percent of all benthic organisms (all stations) over the year. Anthurid isopods and gammarid amphipods were next in abundance, followed by chironomid insect larvae, and finally, pelecypod molluscs (clams). The monthly mean was 1,161 organisms per square meter with peak abundance in the spring (March-June).

2.40 The nektonic community includes many species of fish and invertebrates, some of which are of commercial and recreational value. Tables 5 and 6 give a list of vertebrates and invertebrates captured in the Savannah River during 1972 by otter trawling. Fish species composition data for the Savannah River system during the period 12 July 1967 through 24 August 1967, as reported by the Georgia Game and Fish Commission are as follows: spotted gar, Atlantic menhaden, golden shiner, shiner, white catfish, channel catfish, American eel, spottail, striped mullet, bay whiff and hogchoker. (See Appendix D for a more complete listing of biota.)

2.41 Each spring and fall, the main Savannah River, Back River, Middle River and the numerous interconnecting tidal streams are hosts for the migration of two species of shad, American (Alosa sapidissima) and hickory (Alosa mediocris) and striped bass (Morone saxatilis), which are very important game and commercial fish. The American shad enter the Savannah River in mid-January and begin spawning in mid-April. The river temperature at spawning is between 54° and 70°F. The young shad leave the river in autumn; all are gone by December. Shad spawn in the main river, and further up the river than do striped bass. The American shad is the most commercial anadromous fish in the southeast.

2.42 Hickory shad enter the Savannah River in early January, begin spawning in the tributaries in March and complete spawning in April. Water temperature at spawning is between 64° and 69°F. The young hatch 2-3 days after eggs are laid and leave the river from July to October.

TABLE 5

SCIENTIFIC AND COMMON NAMES OF VERTEBRATES CAPTURED IN THE
SAVANNAH RIVER DURING 1972 BY OTTER TRAWLING
(Stickney & Miller, 1973)

Family	Scientific Name ¹	Common Name
Clupeida	<u>Brevoortia tyrannus</u> ² <u>Opisthonema oglinum</u>	Atlantic menhaden Thread herring
Engraulidae	<u>Anchoa hepsetus</u> <u>Anchoa mitchelli</u>	Bay anchovy Striped anchovy
Ictaluridae	<u>Ictalurus catus</u> ²	White catfish
Ariidae	<u>Arius felis</u> <u>Bagre marinus</u> ²	Sea catfish Gaftopsail catfish
Batrachoididae	<u>Opsanus tau</u>	Oyster toadfish
Pomatomidae	<u>Pomatomus saltatrix</u> ²	Bluefish
Carangidae	<u>Chloroscombrus chrysurus</u> <u>Vomer setapinnis</u>	Atlantic bumper Atlantic moonfish
Sciaenidae	<u>Bairdiella chrysura</u> ² <u>Cynoscion regalis</u> ² <u>Larimus fasciatus</u> ² <u>Leiostomus xanthurus</u> ² <u>Micropogon undulatus</u> ² <u>Stellifer lanceolatus</u> ²	Silver perch Weakfish Banded croaker Spot Atlantic croaker Star drum
Mugilidae	<u>Mugil cephalus</u> ²	Striped mullet
Trichiuridae	<u>Trichiurus lepturus</u>	Atlantic cutlassfish
Stromateidae	<u>Peprilus alepidotus</u>	Harvestfish
Bothidae	<u>Etropus crossotus</u> <u>Paralichthys lethostigma</u> ²	Fringed flounder Southern flounder
Soleidae	<u>Trinectes maculatus</u>	Hogchoker
Cynoglossidae	<u>Symphurus plagiusa</u>	Blackcheek tonguefish
Tetraodontidae	<u>Sphoeroides maculatus</u>	Northern puffer

¹Fishes placed in phylogenetic order according to American Fisheries Society (1970).

²Commercially valuable or sought by sport fishermen.

TABLE 6

SCIENTIFIC AND COMMON NAMES OF INVERTEBRATES CAPTURED IN THE
SAVANNAH RIVER DURING 1972 BY OTTER TRAWLING
(Stickney & Miller, 1973)

Family	Scientific Name	Common Name
Penaeidae	<u>Penaeus aztecus</u> ¹	Brown shrimp
	<u>Penaeus duorarum</u> ¹	Pink shrimp
	<u>Penaeus setiferus</u> ¹	White shrimp
	<u>Xiphopaneus kroyeri</u> ¹	Seabob
Portunidae	<u>Callinectes sapidus</u> ¹	Blue crab
	<u>Portunus gibbesii</u>	Crab
Squillaidae	<u>Squilla empusa</u>	Mantid shrimp
Loliginidae	<u>Loliguncula brevis</u>	Squid

¹Commercially valuable species

2.43 Striped bass enter the Savannah River for their spring spawning runs in March, April, or May. The river temperature must be between 58° and 64°F., and the salinity must be between 920 and 948 ppm for optimum spawning success. The striped bass is a free spawner; the eggs must be suspended in the water, as they float upstream before they hatch 36-72 hours after being laid. The last eggs to be observed in the river usually are found at the end of May. Adult striped bass leave the river in August. One group of juveniles leaves the river in October and November when the water begins to cool; a second group apparently does not migrate. The primary spawning site in the Savannah River Basin is in Back River, 23 miles upstream from the mouth of the Savannah River.

2.44 Commercial and sport fishing within Savannah Harbor is restricted because of industrial and municipal pollution and heavy cargo traffic in the area. The several marine finfish taken around the mouth of the harbor include the spotted sea trout, spot, croaker and other bottom species. Cobia and tripletail provide for a limited amount of sport fishing in the outer channel. The harbor and certain tributaries are currently closed to commercial shellfishing because of excessive coliform levels.

2.45 Vector control. Flooded disposal areas and poorly drained farmlands are utilized by mosquito and other nuisance insects as breeding grounds. Prior to World War II, malaria was a major disease in and around Savannah and the Coastal area. In recent years, the Chatham County Mosquito Control Commission, in cooperation with other local organizations, has attained a remarkable degree of mosquito control through sprays and controlled flooding of these breeding grounds.

2.46 Transportation. Two major U.S. Highways, 17 and 17A, and the Seaboard Coast Line Railroad cross the harbor. Air service is also available through Savannah's Municipal Airport and several local military and private landing fields.

2.47 Description of present disposal sites. Prior to the 1950's, no major local, State or Federal restrictions were applied to either the methods or placement of shoaling materials. Over the 240 year history of the development and maintenance of the Savannah Harbor navigation channel, improvement and maintenance materials were placed along the adjacent river banks in the most economic and convenient locations to the operation. Consequently, over these many years, the nature of the shoreline paralleling the navigation channel was slowly transformed from tidal marsh to a terrestrial community. As a result of the long time use, most of the present retaining areas have been accepted and approved by the various responsible Federal and State agencies. The locations of these disposal areas are shown on Plate 2, page 5.

2.48 Disposal areas 1-A, 1-B and Argyle Island are on the Savannah National Wildlife Refuge. Area 1-A (158 acres) has a dike surrounding the whole area and was first used in 1947. Area 1-B (86 acres) is diked to the north side to prevent dredge material from spilling from

the disposal area into the Refuge and was used in 1947 for disposal. Argyle Island (298 acres) has dikes around the whole area. Part of this area was first used in 1927. These areas were originally diked and used for rice culture.

2.49 Disposal area 2-A has 150 acres diked and 200 acres undiked and adjoins the Argyle Island disposal area. Part of this area was used for deposition of dredged material in 1929. Area 12 (1,260 acres) is diked and was first used in 1965. Scattered remnants of the bulrush-grass type vegetation are still visible along the systems and abandoned rice-fields. Areas 13A and 13B, totaling 2,200 acres, are diked. Parts of these areas were first used for disposal in 1910-1918.

2.50 First used in 1910 and now diked on the channel side and along the Atlantic Intracoastal Waterway is Area 14, which totals 1,800 acres. Seventy percent of this area has already been covered with dredged material. Jones-Oysterbed Island (2,900 acres) was also used for disposal in the period 1910-1918. This area is diked on the channel side. Oysterbed Island, totaling 800 acres, is manmade from dredged material. About 75% of Jones Island has been covered with the deposition of dredged material.

2.51 These parcels, usually composed of sediment deposits, are characterized by undulating topography and are vegetated with woody shrubs and annuals. Marshes are found in the parts of Areas 2A, 14 and Jones-Oysterbed Island farthest from the river. These marshes would not be impacted by the deposition of dredged material for several years, if at all.

2.52 Archeological and historical sites. Within the City of Savannah, an area bordered by East Broad, Gwinnett, West Broad and the Savannah River has been designated as the Savannah Historic District in the "National Register of Historic Places." The historic district is unique because it includes much of the founder's (James Oglethorpe) original city plan, highly regarded because of its important innovations in urban design. Many of the buildings in the district have much architectural merit and exhibit splendid examples of English Regency, Georgian town-house and Gothic Revival architecture. The district also contains many beautiful churches, public buildings and lovely parks.

2.53 Located approximately 3 miles east of Savannah on the south bank of the Savannah River is Fort Jackson. This fortification has played an important historic role in protecting the City of Savannah since colonial times. In 1965, Fort Jackson was presented to the Georgia Historical Commission, which was in the process of restoring the structure for use as a maritime museum. Fort Jackson, which is listed in the National Register of Historic Places, was closed on 1 September 1975.

2.54 Fort Pulaski, an important Civil War monument, is located 17 miles east of Savannah on Cockspur Island. Constructed in the early 19th century (1829-1847), this facility, which served as a major Civil War fortification along the Georgia coast until its capture in 1862 by Federal troops, was established by Act of Congress as a national monument and is listed in the National Register of Historic Places.

2.55 Another Civil War relic, the sunken CSS GEORGIA, a Confederate ram, is located about mile 11 near the confluence of Front and Back Rivers. The designation of the ship as a significant historical structure is presently being considered by Federal authorities. This ship has been located and there will be no dredging in the area of the sunken CSS GEORGIA.

2.56 During October 1973, the Institute of Archeology and Anthropology of the University of South Carolina investigated potential archeological sites in the lower Savannah River area. The investigation revealed two sites in disposal area number 12 and one site on the Savannah National Wildlife Refuge. (See Figure 3 for location.) An examination of these sites indicates they cover a time span from about 3500 B.C. through 1100 A.D., with a late historic occupation during the eighteenth and nineteenth centuries. The Corps of Engineers recognizes the importance of these cultural resources. Sites 38Ja23 and 38Ja24 will be protected by constructing the west side dike approximately 200 feet eastward of site 38Ja24 and constructing a portion of the north dike around site 38Ja23 of disposal area 12. This construction will insure that these areas will not be covered by dredged material removed from the sediment basin (see figure 3).

3.00 Relationship of the Proposed Action to Land Use Plans.

3.01 Coastal zone management. The Coastal Zone Management Act of 1972 (PL 92-583) was signed by the President on 28 October 1972. Under the Act, the Federal government (U.S. Department of Commerce, National Oceanic and Atmospheric Administration) will grant to interested coastal states funds for (1) the development of a coastal zone management program and (2) the administration of each state program. Following state development and Federal approval, Federal projects, leases and permits must conform to the State program. Section 304(g) of the Act defines the state "management program" to include:

. . . but is not limited to, a comprehensive statement in words, maps, illustrations, or other media of communication, prepared and adopted by the State . . . setting forth objectives, policies, and standards to guide public and private use of lands and waters in the coastal zone.

State development of each coastal state program, in coordination with local government and regional planning commissions, should insure consistent state-wide coastal zone management program and policies.

3.02 A Section 305 grant has been awarded Georgia and South Carolina by the U.S. Department of Commerce for the development of the management program for FY 1975-76. A three-year planning phase will be followed by a five year implementation (Section 306) phase.

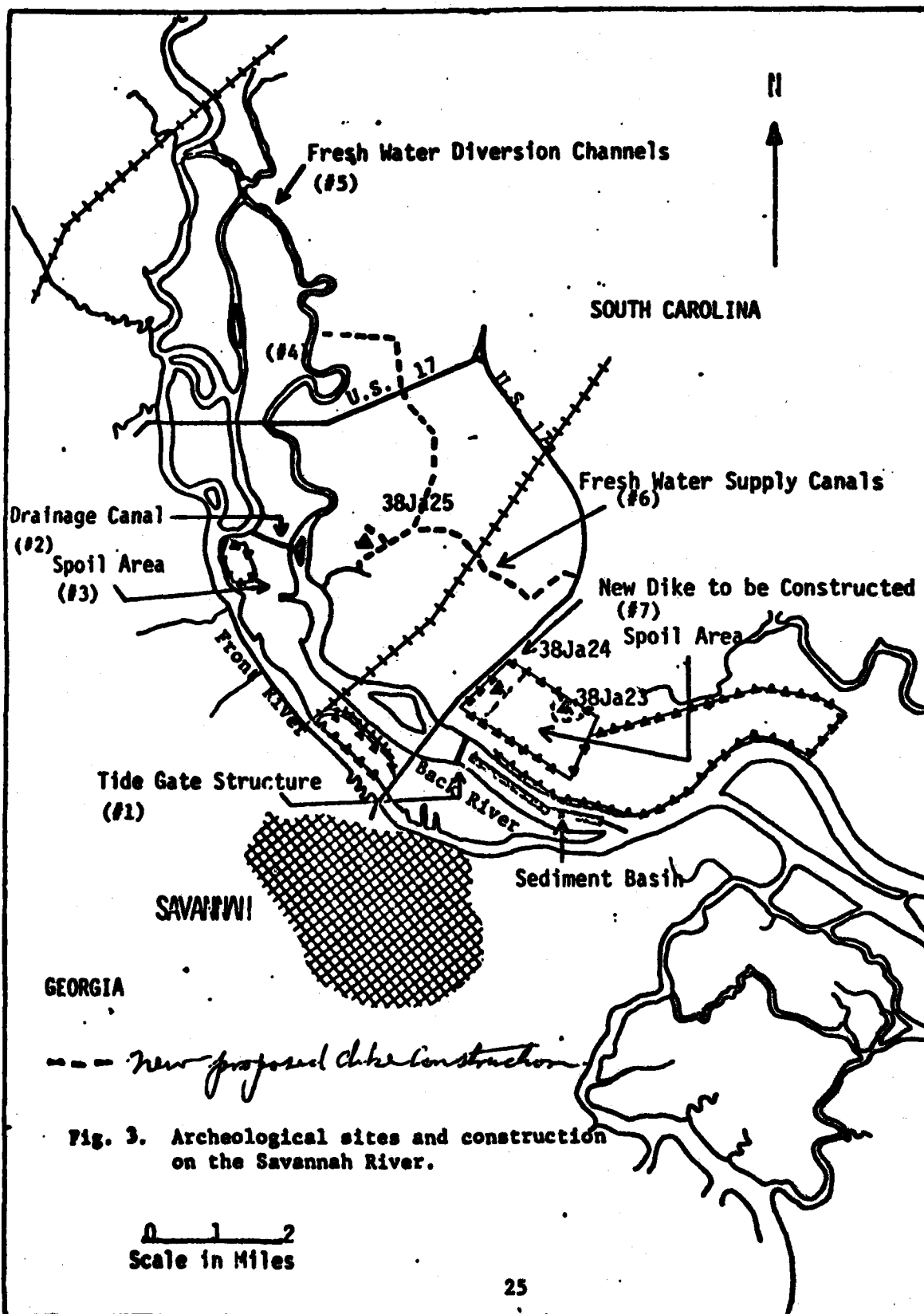


Fig. 3. Archeological sites and construction on the Savannah River.

3.03 The State of Georgia has charged its duties under the Act to the Georgia Office of Planning and Budget (OPB). The OPB is presently developing its base information for the Georgia Coastal Zone Management Program, with analysis of this information and alternative proposals for coastal zone use to follow. At this time, there is no statewide land use plan for the coastal zone within Georgia.

3.04 South Carolina's program is administered by the State's Coastal Zone Planning and Management Council. At present, the Council is working on legislation to implement the Coastal Zone Management Act.

3.05 At the present time, the State of South Carolina has completed several studies which can provide the General Assembly with criteria to develop an overall State Land Use Policy. These studies realize the need for lands and rights-of way for operating and maintaining navigation projects; however, at the present time, the State of South Carolina has no specific land use legislation.

3.06 The area between Front and Back Rivers was originally composed of a series of small islands, tidal marshes and shoals interconnected by shallow waterways. For the past 200 years, this area has undergone extensive environmental changes through the construction of dikes, training walls and the deposition of dredged materials.

3.07 Old root systems, logs and tree stumps visible in the soil profiles northeast of Back River, indicate the probability that in pre-Colonial times this site supported a swamp-hardwood type forest. Probably most of the trees were cut for timber sometime in the 1700's. After removal of the timber, several thousand acres were leveled, diked and irrigated for the production of rice, pastures and other crops. By the late 1930's, most of these lands had been abandoned resulting in the natural establishment of aquatic and semi-aquatic stands of sedge (Cyperaceae), bulrush (Scirpus) and grasses (Gramineae); while the canal dikes, drainage ditches and small islands supported pine (Pinus) and deciduous tree growth.

3.08 Several of the old plantations lying southeast of the Savannah Wildlife Refuge are still in operation although rice production, at least for the present, has been discontinued. Many of the old ricefields have been flooded to provide waterfowl habitat for private hunting, while the drier sites are today seeded to pasture, small grains and a few row crops.

4.00 The Environmental Impact of the Proposed Action.

4.01 Project description. The Savannah Harbor Operation and Maintenance Project utilizes and maintains existing disposal sites to their maximum capacity or term of lease and establishes the need for additional disposal methods to meet future needs. The program also recognizes that within this time frame, continued investigation into new disposal methods and utilization of shoaling materials could offer several additional alternatives.

4.02 Water quality. Dredging activities associated with the project should have little, if any, long-term detrimental impact upon the water quality of Savannah Harbor. The environmental aspect of dredging in the proposed project area which may lead to possible ecological damages is the water quality impairment of the surrounding waters during the dredging operation. To evaluate the impact of dredging on the impairment of water quality, chemical analyses and the standard elutriate test were made on sediment and water samples collected in the project area (see Figure 2, and Tables 2 and 3, pages 11, 12 and 13, respectively). The result of the chemical analyses of the sediment samples taken at locations 1 through 6 inclusive exceeded the Environmental Protection Agency's (EPA) "Criteria for Determining Acceptability of Dredged Spoil Disposal to the Nation's Waters." The chemical constituents in these samples which exceeded EPA criteria were volatile solids, COD, Total K Nitrogen, oil and grease, and Zn. However, none of the samples taken in the project area failed the elutriate test in Hg, Pb, Zn or nitrogen after an application of a factor of 10 dilution, as prescribed in section 230.4-3, Federal Register, Vol. 40, No. 88, May 6, 1975. The dredged material will be placed either in diked areas, areas diked along the channel side, or in an EPA approved ocean site. Windom (1972) reported that in sediments to be dredged there exists a large concentration of reduced iron (Fe^{++}). When this iron is dredged and thrown into suspension, it is immediately oxidized, forming iron hydroxide in the marine environment due to the high alkalinity. The iron hydroxide is a colloidal gel capable of scavenging other metals or oil-grease laden particles out of solution and precipitating these metals along with the iron so that they accumulate in the sediments of the disposal area.

4.03 Corresponding changes in water quality during dredging operations cannot be predicted simply on the basis of chemical analyses of the sediments. Research by Skidaway Institute of Oceanography, conducted during 1971 in the Savannah River, showed that values for heavy metals from bottom sediments and amounts of the same elements in the water column during dredging could not be correlated. Samples were taken from bottom sediments, the river upstream from the dredge, the dredge discharge pipe, and the effluent from the weir outlet. Heavy metal parameters for these samples did not exceed EPA limits for dredging operations (Windom, 1972). The paper by Windom also noted that "the quality of the effluent from the weir outlet is essentially identical with that of the river water with the exception that the weir outlet water has a slightly higher pH and a considerably higher dissolved oxygen concentration."

4.04 An increase in suspended solids and in turbidity may be encountered in the immediate vicinity of dredging and may persist for a limited period following termination of dredging activities; however, no significant degradation in water quality is anticipated from these increases. Due to current velocities and the rapid flocculation of suspended material, interference with light penetration and productivity will be limited to the time the dredge is operating and for a brief period thereafter. Standards for turbidity have been established by the Environmental Protection Agency and adopted by the U.S. Army Corps of Engineers. Table 7 shows dredge turbidity measurements taken in the Savannah Harbor. Turbidity measurements reported by the Georgia Department of Natural Resources

at U.S. Highway 17 (mile 21.6), which is above the project, and at Fort Jackson (mile 11) are found in Table 8.

TABLE 7

DREDGE TURBIDITY MEASUREMENTS, SAVANNAH HARBOR, GEORGIA

TURBIDITY IN JACKSON UNITS (JU)

DISTANCE IN FEET BELOW DREDGE

Depth of Measurement	Cutterhead	50 FT	500'	1000'	1500'	Background
MEASUREMENTS TAKEN 6 MARCH 1974						
3 feet	18 JU	19 JU	18 JU	16 JU	16 JU	17 JU
10 feet	17 JU	19 JU	19 JU	16 JU	16 JU	16 JU

The cutterhead depth was between 35 and 41 feet. Dredge was at mile 9.14.

TABLE 8

TURBIDITY MEASUREMENTS, SAVANNAH RIVER
TURBIDITY IN JACKSON UNITS (JTU)

Date	U.S. Highway 17 (mile 21.6)	Fort Jackson (mile 11)	
	3 foot depth	3 foot depth	20 foot depth
7/2/74	25 JTU	42 JTU	63 JTU
8/13/74	25 JTU	25 JTU	32 JTU
9/3/74	16 JTU	13 JTU	10 JTU
11/5/74	11 JTU	16 JTU	18 JTU
12/4/74	28 JTU	28 JTU	84 JTU

(Environmental Protection Division, 1975)

4.05 Economic. The plan of action proposes a long-range program for disposing of the estimated 7 million cubic yards of sediments dredged annually from the navigation channels of Savannah Harbor. The harbor facilities service a principal area comprising all or parts of five states with a population which exceeded 5.5 million persons in 1970. Within metropolitan Savannah and adjacent communities, the harbor area

supplies direct employment to over 10,000; more than 175 industrial plants to some degree are dependent on the harbor facilities, and revenue tonnages passing through the port in 1974 exceeded 100 million dollars. Economists estimate that this type of revenue generates an economic impact approximately three times its original value in the local economy. Without the annual operation and maintenance program, Savannah Harbor, within three years or less, would no longer accommodate deep water vessels. The disastrous economic impact of closing the Savannah Harbor would be felt over a wide area of the southeastern United States.

4.06 Land use. Few land use changes will result from the operation and maintenance project. Retention areas 14 and Jones-Oysterbed Island, totaling about 4,700 acres, will adequately provide for the 7-1/2 miles of channel downstream of the Bight. The only change foreseen to these two sites is a rise in the present ground elevations. Disposal areas 1-A, 2-A, 1-B, Argyle Island, 12, 13-A, and 13-B will have reached their capacity at various times between 2000 and 2015. Potential land use conversions beyond this time could be industrial, recreational areas or wildlife habitat. What changes will take place will be dependent on ownership, location and local requirements.

4.07 Aesthetics. The proposed project is not expected to have any long-term adverse visual or aesthetic impacts. During the time maintenance dredging is conducted, it is conceivable that some visual and aesthetic impacts will occur due to the presence of the dredge and pipelines. However, these impacts will be short-term and they could be considered to be a part of the normal activities associated with a working harbor. After the use of these sites is completed, the visual and aesthetic qualities of the areas will be the same as they were prior to maintenance dredging. Thus, the areas will not be changed as to the aesthetic qualities.

4.08 Wildlife resources. The proposed program will have a relatively minor impact on the overall wildlife in the area. No major wildlife resource exists within the disposal areas. The mammals inhabiting the areas are limited in number and include rabbits (Sylvilagus palustris), raccoons (Procyon lotor) and opossums (Didelphis marsupialis). As disposal activities are begun in an area, the wildlife will be displaced to surrounding areas, but will return as the plant life returns after dredging activities cease. Generally, the areas between Mile 7 and U.S. 17A are sparsely vegetated with scattered annuals and shrubs. Each new increment of dredged material recreates conditions which are ideal for shore birds.

4.09 Aquatic resources. The destruction of bottom habitats in the dredged area is a distinct environmental aspect of dredging in the proposed project area which may lead to possible ecological damage.

4.10 The effects of this aspect of dredging cannot be minimized; therefore, once the decision is made to dredge the area, based on social, economic and environmental considerations prior to the dredging operations, this damage is inevitable. However, the damage to bottom habitats and their benthic community is temporary. According to the studies made by Robert R. Stickney and Daniel Perlmutter (1975), maintenance dredging

of the Atlantic Intracoastal Waterway through Georgia appears to have a short-lived impact on the benthic infauna (organisms which cannot demonstrate an effective avoidance pattern) of the dredged channel, at least in areas having soft sediments. Complete, or nearly complete, removal of benthos is effected by dredging, although recovery begins within a month following the dredging operation. Diversity and species composition rapidly return to their pre-dredging levels, and in the case of diversity values, are higher than those observed before dredging occurs. These observations were associated with maintenance dredging of sediments high in silt and clay, which are similar to the sediment requiring maintenance dredging in the Savannah Harbor.

4.11 The mechanisms of recolonization are not understood but two processes seem likely. Movement of benthic organisms into the dredged area by the settling of larval, juvenile and adult animals from the water column is one method of recolonization. Secondly, after dredging, the walls of the new channel slump to some extent. Benthos inhabiting adjacent bottom may be carried into the channel bottom area along with the slumping sediments.

4.12 The dredging activities anticipated for the proposed project would not have any long-term effects on the ichthyofauna and benthic macro-invertebrates. Stickney (1972) reported that if dredging of the Intracoastal Waterway in Georgia has any effect on the vertebrate and invertebrate organisms captured by otter trawling, his investigations were not able to demonstrate them. Diversity of species was obtained through the utilization of two indices. The data obtained from the diversity indices failed to demonstrate any long-term effects of dredging.

4.13 Each spring and fall, the Front River, Back River, North Channel, South Channel, and the numerous interconnecting tidal streams are hosts to two anadromous species of commercial and/or sport fishes; namely, shad (*Alosa spp.*) and striped bass (*Morone saxatilis*). Construction and maintenance dredging are not anticipated to have any significant adverse impact upon either the population or spawning habitat of these anadromous species of the Savannah River and its tributaries. Corps personnel have observed spawning migrations while dredging operations were ongoing. Migrating striped bass and shad periodically pass the construction sites when traveling upriver to spawning areas. The harbor width varies from approximately 800 to 1,000 feet, which provides ample swimming area for these anadromous species during dredging operations. However, F&WS and EPA have suggested that no dredging work be performed in the channel during the months of February through May so as not to interfere with the spawning migrations. The Corps will restrict its dredging to periods other than February-May as much as possible.

4.14 Archeological and historical. The National Register of Historic Places has been consulted and Fort Jackson and Fort Pulaski would not be affected by the project. The two archeological sites in one disposal area will be protected by the construction of dikes. Likewise, the proposed action will not adversely affect any existing, proposed or known

potential units of the National Park System or any known historic or natural sites eligible or considered potentially eligible for the National Landmark Program.

4.15 Rare and endangered species. Rare and endangered species which occur within the general project area are listed below.

TABLE 9

RARE AND ENDANGERED SPECIES OF SAVANNAH HARBOR AREA

Common Name	Scientific Name
brown pelican	<u>Pelecanus occidentalis</u>
southern bald eagle	<u>Haliaeetus leucocephalus</u>
American peregrine falcon	<u>Falco peregrinus</u>
red-cockaded woodpecker	<u>Dendrocopus borealis</u>
American alligator	<u>Alligator mississippiensis</u>

None of these species will be affected by the project.

5.00 Any Adverse Environmental Effects Which Cannot Be Avoided.

5.01 Water quality. During dredging activities, increases in suspended solids and turbidity will occur in a very localized area. These changes in water quality will be temporary and will rapidly disappear after termination of the operation. Retention dikes are and will be designed and constructed, where necessary, on the outer perimeter of disposal basins to contain the liquids and solids of shoaling materials. Each ponded area will have adequate surface area and depth to provide time for settlement of solid materials. Effluent from disposal areas will be conveyed from the areas through outlet structures consisting of weirs, drop inlet culverts or rectangular outlet structures, which will be located at such elevations as to minimize flow velocities and assure maximum settlement of solids within the ponded area. When adjustable weirs are used, they will be set at elevations to give sufficient pool capacity to provide an effluent which will meet State water quality standards.

5.02 Land use. Disposal area sites currently available and in use for harbor maintenance dredging operations total approximately 9,000 acres. All of these tracts have been actively in use for many years and have changed from their original condition. The ultimate characteristic of these changes will result in a terrestrial land form. This increased elevation will eventually provide several possible land use options such as agricultural, industrial, recreational development, or wildlife habitat.

5.03 Biological resources. Both localized increase in suspended solids and destruction of sessile populations at the dredging sites are unavoidable. However, the ability for these biotic communities to repopulate, so long as the existing community is healthy and viable, is well documented. The state of health of the existing community is the limiting factor governing the time for recolonization of sessile and detritivore organisms. The "coming back" of macroinvertebrates and fish is directly dependent on recolonization of the above-mentioned lower forms.

5.04 From Stickney's studies (1972), it appears that dredging and undiked deposition of sediments have no lasting adverse effects on fish or macroinvertebrate populations. A great portion of the less motile benthic organisms in the work area will be destroyed, but benthic sampling has revealed that several species were still present in some quantity following dredging. "Recovery of the benthic populations to levels approaching those of control stations appeared to be rapid" (Stickney and Perlmutter, 1975).

5.05 Minor adverse effects on productivity will occur from high turbidity levels in the immediate vicinity of the dredging and disposal areas as the euphotic zone is reduced.

5.06 Any adverse effects on navigation by the larger ships and vessels using the channel will be minimal, based on past maintenance dredging experience. Additional precautions will be required by vessels passing the dredges to avoid accidents or collisions; however, channel widths are generally adequate to preclude any significant hazards to navigation.

5.07 Disposal area sites currently available and in use for harbor maintenance dredging operations total approximately 9,000 acres. All of these tracts have been actively in use for many years and have changed from their original condition. The ultimate characteristic of these changes will result in a terrestrial land form. This increased elevation will eventually provide several possible land use options such as agricultural, industrial, recreational development, or wildlife habitat.

6.00 Alternatives to the Proposed Action. In planning for the future operation and maintenance of Savannah Harbor, it appears that some time around the year 2000 either new disposal methods, new sites, or a combination of these measures will be required.

6.01 Recycling dredged sediments for construction materials, industrial products and other uses. Under this proposal, the sediments are stockpiled in one or several disposal sites and the materials sorted and recycled for such uses as road materials, land fills, industrial bricks or other building products. Environmentally, this solution is quite acceptable because it requires a minimum amount of disposal areas and eliminates adverse effects on the adjacent ecosystem. Economically, it is potentially a highly desirable solution. It would reduce the continuing projected need for new disposal sites, more permanent types of retaining walls can be justified and income from the byproducts might

offset some of the initial dredging expenses. Unfortunately, at the present time, there is no readily available market for the materials and such markets do not appear to exist within a reasonable distance of the Savannah Harbor. The reuse and development of byproducts from river sediments has great potential and the U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, is presently investigating improved disposal techniques and developing or extracting marketable materials from the sediments. Within the time span of this program, it is possible that these investigations will yield positive and feasible procedures to achieve a workable program.

6.02 Ocean dumping of dredged materials. Ocean dumping is the transport of materials from the shoaling area to some point offshore. The materials can be conveyed to the dumping ground by two separate methods. The first method requires a permanent holding pond or convenient relay point adjacent to the navigation channel. Shoaling materials can be transported to this holding site by a permanent pipeline, pipeline dredge, hopper dredge or any convenient combination of these facilities. After settling and storage in the holding site, the materials would be repumped into a hopper dredge at some convenient time and transported to the ocean dumping site. The second method would be to dredge all shoaling areas with a hopper dredge and transport the materials directly to the ocean site. The Environmental Protection Agency has approved a temporary ocean dumping site approximately 7.5 miles southeast of Tybee Lighthouse. A 6,000 cubic yard hopper dredge, making five round trips per day to the ocean site, can transport approximately 30,000 cubic yards each 24 hours. Deducting about 10 percent of the operation as "down time" due to maintenance, inclement weather or other factors, about 800,000 cubic yards could be moved per month at a cost of about \$.50 per cubic yard. With the above schedule, it would take approximately eight months to remove the estimated 6.3 million cubic yards of materials annually accumulating in the navigation channel. Although no hopper dredges are available with a capacity greater than 6,000 cubic yards, industry spokesmen indicate dredges can be built with a 15,000 cubic yard capacity. With a dredge of this capacity, including 10 percent "down time", the annual accumulation of shoaling materials in the navigation channel could be removed in approximately three months at a possible cost of less than \$.50 per cubic yard.

6.03 This proposal would eliminate the need for all but one or two relay sites throughout the harbor, an environmentally desirable feature. Old disposal areas could be developed for a variety of uses and the need for additional sites will be eliminated. The present approved dumping area is temporary and, at any time, could be declared void.

6.04 Use of other harbors. An alternative would be to use other harbors. Other harbors situated within a reasonable distance of Savannah Harbor which could be considered as possible alternate shipping ports include Brunswick Harbor, Georgia; Port Royal Harbor, South Carolina; and Charleston Harbor, South Carolina. Because of existing project dimensions, two of these harbors--Brunswick and Port Royal--could not handle the large vessels now calling at Savannah. The transfer of the Savannah Harbor operation to other ports would, in addition to requiring the abandonment

of the multi-million dollar existing port and industrial facilities, have a very negative impact upon the social and economic aspects of the area. It would require the dislocation of a large portion of the labor force, thereby creating a costly and traumatic experience for a significant segment of the area residents. Environmentally, this solution is unacceptable because it would require the disruption and conversion of a large portion of the estuary system adjacent to the alternate harbor in order to accommodate the additional industrial and commercial demand imposed upon the area.

6.05 Eliminate all maintenance dredging. This proposal is unacceptable because without maintenance dredging, the navigation channel, within three years or less, would no longer accommodate deep draft ocean vessels. The socio-economic impact of closing the Port of Savannah would have a significant adverse economic effect upon a five state area.

7.00 The Relationship Between Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity. The proposed maintenance plan will preserve the long-term productivity of Savannah Harbor as a shipping facility. The immediate impacts of the proposal upon the environment are a temporary increase in turbidity and the loss of plankton and benthic organisms from dredging operations. Some of these impacts will be accepted in return for the beneficial effects of continued operation and maintenance of the Savannah Harbor navigation channel.

7.01 A spin-off effect of dredging associated with increased turbidity levels is the release and redistribution of nutrients contained in channel bottom silts. As a naturally occurring phenomenon of shallow estuaries, wind-induced turbidities play a major role in the productivity of those water bodies by nutrient distribution of shoreline marsh areas. This is nature's way of sustaining habitat productivity.

8.00 Any Irreversible and Irretrievable Commitments of Resources Which Would Be Involved in the Proposed Action Should It Be Implemented. The proposed project requires the destruction of portions of the benthic biota that now exist. Although these organisms are irretrievable, it is believed that their communities are retrievable. The commitment of labor and material utilized during maintenance dredging is also involved.

9.00 Coordination and Comment and Response.

9.01 Coordination with other agencies. Most of the present disposal sites were in use for many years prior to the enactment of the National Environmental Policy Act (NEPA) or other Federal, State and local regulations governing the methods and locations to be used for the disposal of dredged materials. Dredging requirements are submitted each year for review and comment to the following Federal and State agencies:

Federal: Department of the Interior
Environmental Protection Agency
National Marine Fisheries Service
Department of the Army, Waterways Experiment Station

State: State of Georgia
Department of Natural Resources
Environmental Protection Division (DNR)
Game and Fish Division (DNR)

State of South Carolina
State Board of Health
Wildlife and Marine Resources Department
Water Resources Commission

9.02 Draft Environmental Statement. On 30 December 1974, the Draft Environmental Statement was furnisheded to numerous Federal, State and private organizations. The organizations listed below submitted comments and suggestions on the Draft Environmental Statement.

U.S. Department of Commerce
U.S. Department of Housing and Urban Development
U.S. Department of the Interior
U.S. Department of Transportation
U.S. Coast Guard
Federal Highway Administration
U.S. Environmental Protection Agency
Georgia Office of Planning and Budget
South Carolina State Clearinghouse
South Carolina Water Resources Commission
Chatham County-Savannah Metropolitan Planning Commission

9.03 As a result of the suggestions and comments received from the above organizations, numerous revisions have been made to the EIS. The more important and representative comments are summarized below. Copies of the correspondence are attached as an inclosure to this statement. (See Appendix E.

9.04 U.S. Department of Commerce. In a letter dated 19 February 1975, the Department of Commerce furnished the following comments to the Draft Environmental Statement.

9.05 Comment: General Comments. A number of tidal bench marks are located along those portions of the Savannah River covered in the subject document. The marks are shown on the attached Tidal Bench Mark Index Map for Georgia. Also, a number of geodetic control survey monuments are located along the banks of the Savannah River, its associated channels, and in the proposed disposal areas.

If there is any planned activity which will disturb or destroy these monuments, the Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Survey requires not less than 90 days notification in advance of such activity in order to plan their relocation, and we recommend that funding for this project include the cost of any relocation required for such monuments and marks.

9.06 Response: There is no planned activity which will disturb or destroy the monuments.

9.07 Comment: 2.00 Environmental Setting Without the Project, Page 5, paragraph 2.09. This section would be improved if discussion and data were presented on the sources and amount of sediment being introduced into the harbor area.

9.08 Response: The sources and amount of sediment being introduced into the harbor area have been added in Section 2.10.

9.09 Comment: 4.00 The Environmental Impact of the Proposed Action, Page 19, paragraph 4.02. Reference is made to research conducted by the Skidaway Institute of Oceanography regarding the effects of dredging on water quality parameters. The results of this study should be provided in the final environmental impact statement, preferably in tabular form.

9.10 Response: This section has been reworded and the literature has been cited.

9.11 Comment: Page 20, paragraph 4.03. The data provided in Table 4 of this section would be more useful and significant if bottom turbidity measurements were provided for several stations. Suspended materials may flow along the bottom of given water systems without any indication of turbidity near the water's surface.

9.12 Response: The data is not available for bottom turbidity measurements.

9.13 Comment: 5.00 Any Adverse Environmental Effects Which Cannot Be Avoided, Page 22, paragraph 5.03, Biological resources. The draft environmental impact statement states that "Dredging activities will temporarily reduce the benthic and plankton populations located in shoaling areas; however, this reduction will have no significant impact upon the higher organisms of the harbor. Past investigations have shown that benthic organisms destroyed as a result of dredging operations normally repopulate the site two to six months following such dredging." These conclusions should be supported by appropriate data and documentation.

9.14 Response: This section has been rewritten and sources of information have been cited.

9.15 Comment: 6.00 Options for the Proposed Action, Page 23, paragraph 6.01 - 6.02. In planning for the future operation and maintenance of the Savannah Harbor, the statement should consider the possibility of regulating dumping permits in order to reduce or eliminate the amount of sludge released into harbor areas. This policy would have the effect of ameliorating engineering problems related to stresses built up on the containing structures due to the spoil drying process.

9.16 Response: Any dumping in the Savannah Harbor would require a Section 404 permit and, at this time, no Section 404 permit has been issued for dumping in the Savannah Harbor. All industries in the Harbor except one have secondary treatment. The City of Savannah has recently constructed a waste treatment plant which is operational.

9.17 Comment: As mentioned earlier (comments on paragraph 2.09), the statement should contain a description of sources of sediment to the harbor area. Moreover, the discussion of alternatives to the proposed project should consider the feasibility of reducing the amount of sediment from the various sources.

9.18 Response: The sources and amount of sediment being introduced into the harbor area have been added in Section 2.10. If the Department of Commerce has any data on how to reduce sediment from these sources, the Corps will be happy to incorporate such information into this EIS or to issue a supplement containing this information.

9.19 Comment: Finally, the draft environmental impact statement should be expanded to address the potential impact of the proposal on the Savannah Wildlife Refuge and on the Tybee Island beach erosion control efforts.

9.20 Response: There will be no impact on the Savannah Wildlife Refuge or on the Tybee Island beach erosion control efforts from maintenance dredging.

9.21 U.S. Department of Housing and Urban Development. In a letter dated 7 February 1975, the Department of Health, Education and Welfare furnished the following comments to the Draft Environmental Statement.

9.22 Comment: 1. In general, HUD defers to other agencies with respect to establishing and enforcing air and water quality standards, hydrological standards, fish and wildlife conservation measures and archeological concerns. Since we have no formal jurisdiction in these matters, the absence of comments on the validity of the information regarding these areas contained in your DEIS should not be construed as approval or concurrence.

9.23 Response: No response required.

9.24 Comment: 2. We recommend deleting all references to potential residential development as a future land use for abandoned or discontinued disposal sites since the nature of the fill is unstable and unsuitable for economically feasible residential uses.

9.25 Response: Concur. All references to potential residential development as a future land use for abandoned or discontinued disposal sites have been deleted.

9.26 Comment: 3. We also recommend further exploration into the possibility of using the recycling option exclusively or in combination with other alternatives mentioned in your DEIS.

9.27 Response: The reuse and development of byproducts from river sediments has great potential and the U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, is presently investigating improved disposal techniques and is developing or extracting marketable materials from sediments.

9.28 U.S. Department of the Interior. In a letter dated 25 February 1975, the Department of the Interior furnished the following comments on the Draft Environmental Statement.

9.29 Comment: The project consists of continuation of dredging and maintenance to the Savannah Harbor and Savannah River. Besides the presently used disposal areas, an additional 4,000 acres will be required in the near future. The statement fails to mention that the spoil areas in the upper harbor area are on the Savannah National Wildlife Refuge; therefore, the deposition of spoil would require careful handling and containment. The area to be dredged is used by several species of anadromous fish, including striped bass, herring, and shad. High turbidity at critical biological times could be very damaging to fish. The impact on minerals should be minimal, as the resources are relatively widespread. Although the statement does not discuss project impact on mineral resources or their availability, we believe it is acceptable. It is also adequate from the standpoint of recreational interests.

9.30 Response: Based upon data on the disposal areas discussed in the EIS, there is no indication that an additional 4,000 acres will be required in the near future. The ownership of the disposal areas in the upper harbor has been added to the EIS. Information on the anadromous fish has been expanded.

9.31 Comment: SUMMARY. 3.(B.) Adverse Environmental Impacts. This section lists the various impacts of the project on the environment but fails to mention the effects on anadromous fish migration and spawning. In our opinion, maintenance dredging could damage the migration and spawning of striped bass, herring, and shad and should be mentioned in this discussion.

9.32 Response: Corps personnel have observed spawning migrations while dredging operations were ongoing. The river is wide enough to allow the fish to pass the dredge while dredging is taking place.

9.33 Comment: PROJECT DESCRIPTION. Project details, page 1, paragraph 1.04. The disposal areas, 1-A, 1-B, and Argyle Island, are all located on the Savannah National Wildlife Refuge under permit from the Fish and Wildlife Service. Fish and Wildlife Service records show that these spoil areas comprise a total of 542 acres, not 380 acres as shown. There is an apparent conflict between this paragraph which implies no additional spoil areas are needed on the refuge on Argyle Island. No additional spoil easements on the refuge are contemplated by the Fish and Wildlife Service.

9.34 Response: The statement is in error and the EIS has been corrected to show that there are 542 acres in disposal areas 1-A, 1-B and Argyle Island. The plate was in error and a new plate has been added to the EIS.

9.35 Comment: Page 2, paragraph 1.07. If it is determined that major improvements will be carried out on disposal area 13-A, the statement should clearly detail exactly what these improvements will be. Fort Jackson, listed on the National Register of Historic Places, is located on

the south bank of the Savannah River across from disposal area 13-A. While the national register site is physically removed from the disposal area, it may well be within visual range.

9.36 Response: The dikes on Area 13-A have recently been raised and the dikes have already revegetated themselves. Fort Jackson was closed by the State of Georgia on 1 September 1975.

9.37 Comment: ENVIRONMENTAL SETTING WITHOUT THE PROJECT, Aquatic resources, page 15, paragraph 2.34. This paragraph deals with migration and spawning of commercial and sport fishes. It states that the spawning run for striped bass begins in April and continues through May. Spawning generally begins earlier than this; in fact, it is preferable for dredging to be confined to the period between September 15 and January 30 of any year so as to minimize impact on anadromous fish migration and spawning.

9.38 Response: The statement has been changed to show that striped bass enter the Savannah River from their spawning runs in March, April or May. The Corps will restrict its dredging to periods other than February-May as much as possible.

9.39 Comment: Description of present disposal sites, page 16, paragraph 2.39. This paragraph should bring out the fact that spoil areas 1-A, 1-B, and Argyle Island are located on the Savannah National Wildlife Refuge and have been used for disposal only since 1964. There is no question but that the refuge disposal areas were primarily tidal marsh originally. As of this date, they still retain some unfilled tidal marsh and are not completely "terrestrial areas" as indicated in this paragraph. They are, of course, committed to use for spoils disposal under terms of the existing permit issued by the Fish and Wildlife Service.

9.40 Response: Disposal areas 1-A, 1-B and Argyle Island are located on areas of the Savannah National Wildlife Refuge which are not managed for wildlife. Parts of areas 1-A and 1-B were first used for disposal sites in 1947. Part of Argyle Island was first used in 1927 for the deposition of dredged material.

9.41 Comment: Archeological and historical sites, page 17, paragraph 2.41. There is no indication in the statement that the State Historic Preservation Officer for the State of Georgia has been consulted. His comments should be included in the final statement.

9.42 Response: The State Historic Preservation Officer for the State of Georgia has been consulted. A letter from the State Archeologist is included in Appendix E.

9.43 Comment: Page 17, paragraph 2.42. The effects on Fort Jackson as a result of improvements on disposal area 13-A should be discussed.

9.44 Response: See Response 9.36 above.

9.45 Comment: Page 17, paragraph 2.44. The location of the CSS GEORGIA in relation to dredging operations should be discussed. Until a final determination is made on the eligibility of the relic for nominations to the National Register of Historic Places, it should be considered as eligible. As such, it is the Federal agency's responsibility to discuss steps taken to comply with the Advisory Council on Historic Preservation's "Procedures for Protection of Historic and Cultural Properties" (Federal Register, January 25, 1974), Section 800.

9.46 Response: The sunken CSS GEORGIA is located at the mouth of the Back River and there will be no dredging in the area of the sunken Confederate ram.

9.47 Comment: Page 17, paragraph 2.45. The completed archeological survey, recommendations, and final evaluation data should be included in the final statement.

It is the constructing agency's responsibility to determine eligibility of cultural resources found in the area of the project's influence for nomination to the National Register of Historic Places. Criteria for eligibility are provided in Section 800.10.

9.48 Response: The Corps of Engineers recognizes the importance of these cultural resources. Sites 38Ja23 and 38Ja24 will be protected by constructing the west side dike approximately 200 feet eastward of site 38Ja23 of disposal area 12. This construction will insure that these areas will not be covered by dredged material removed from the sediment basin (see Figure 3, page 25). The completed archeological survey is contained in "Sediment Basin Project, Savannah Harbor, Georgia" by Leland G. Ferguson, Research Manuscript Series, No. 52, Institute of Archeology, University of South Carolina, November, 1973.

9.49 Comment: THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION AND ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED, Page 20, table 4. This table deals with dredge turbidity measurements in the Savannah Harbor and displays turbidity measurements made at depths of 3 feet and 10 feet. It would be helpful to have measurements at or near the bottom where turbidity can be quite critical to the fishery.

9.50 Response: These measurements were not taken. A new table has been added to this paragraph.

9.51 Comment: Aquatic resources, page 21, paragraph 4.07 and Biological resources, page 22, paragraph 5.03. These paragraphs state that recent investigations have shown that benthic communities will return in 2 to 6 months. Our comment is that there are also studies that reveal that some benthic communities destroyed by dredging activities are never completely restored.

9.52 Response: These paragraphs have been rewritten. Studies made by Stickney 1972 and Stickney and Perlmutter (1975) have been referenced.

9.53 Comment: OPTIONS TO THE PROPOSED ACTION, Page 23, paragraph 6.00. The statement in this paragraph that new sites or methods will be required within 8 to 10 years appears to contradict the first paragraph under 6.01 which implies present disposal sites are adequate. The discussion of "options for the proposed action" leaves considerable doubt as to what the "proposed action" really is.

9.54 Response: This section has been changed. The present disposal sites are adequate until the year 2000.

9.55 Comment: Ocean dumping of dredged materials, page 24, paragraph 6.05. The last sentence in this paragraph should be supported by factual evidence, particularly in view of the environmental consequences of using land sites beyond those presently committed.

9.56 Response: This sentence has been deleted.

9.57 Comment: ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED, Page 26, paragraph 8.00. We believe the second statement to be an understatement of fact. We further believe there is no probability that marsh areas with 20 feet of spoil would reestablish themselves as tidal marsh within any reasonable time span.

9.58 Response: Concur. This section has been rewritten.

9.59 U.S. Department of Transportation, U.S. Coast Guard. In a letter dated 8 January 1975, the Coast Guard furnished the following comment to the Draft Environmental Statement.

9.60 Comment: As requested in your letter of 26 December 1974, the subject EIS has been reviewed by this office and no conflicts within Coast Guard mission areas were noted.

9.61 Response: No response required.

9.62 U.S. Department of Transportation, Federal Highway Administration. In a letter dated 14 January 1975, the Federal Highway Administration, Region Four, furnished the following comment to the Draft Environmental Statement.

9.63 Comment: According to our review, the proposed project crosses only two Federal Highways, U.S. Routes 17 and 17A. As we understand the project, it will involve the maintenance of the existing channel only, with no new widening and deepening of the channel, in the vicinity of the highway crossings of the Savannah River. Consequently, we have no comments concerning the proposed project; however, we are forwarding a copy of the Draft EIS to the Georgia Department of Transportation for their review and comment.

9.64 Response: No response required.

9.65 U.S. Environmental Protection Agency. In a letter dated 19 February 1975, the Environmental Protection Agency furnished the following comments to the Draft Environmental Statement.

9.66 Comment: A major environmental concern is the high rate of deposition of sediment (7,000,000 cubic yards per year) and the rate at which the removal of this sediment is consuming valuable marshlands with present disposal practices. The marsh areas being consumed are adjacent to the main streams and channels, and that portion of marsh bordering the streams is most valuable to the marine ecosystem, since this interface acts as the feeding ground for fishes, shellfish, crabs, etc., which live on the organisms produced by the marsh environment. Blocking off this portion of the marsh also greatly decreases the value of the remaining interior marshlands.

9.67 Response: The interface has already been changed by past use of these areas. No new areas will be impacted by the disposal of dredged material.

9.68 Comment: Since blocking off the marshes by piling sediments along the river channels will eventually funnel most of the sediments to the ocean, we believe that from an environmental standpoint, ocean disposal is the best long-term solution to maintaining Savannah Harbor. A study, however, would be necessary to select an ocean site with optimum environmental advantages since protection of the bathing beaches is an important consideration.

9.69 Response: Historically, there is no indication of a delta forming on the Savannah River. On the south side of the Savannah River the marshes still exist. In fact, most of this land is part of Fort Pulaski National Monument. Therefore, it is questionable that the sediments would be funneled to the ocean. Ocean disposal is an excellent solution, provided that there is equipment to handle it economically.

9.70 Comment: In addition, we suggest several corrections in regard to the acceptability of sediments for open water disposal so that the Statement agrees with present criteria limitations.

The statement on Page 7, Paragraph 2, appears incorrect and should be clarified. Specifically, Samples 1, 2, 3, and 4 shown in Table 2 exceed EPA criteria for open water disposal. Sample 5 does not exceed the criteria but its location is unknown to us because it is not shown on Figure 2.

Present EPA criteria for open water disposal were established January 11, 1971, and until such time as new criteria are promulgated for interior waters, these criteria are still in effect. However, new criteria have been promulgated for the disposal of dredged materials in ocean waters, and these criteria are contained in the Federal Register dated October 15, 1973. (Volume 38, Number 198, Part II, Environmental Protection Agency, Ocean Dumping, Final Regulations and Criteria.) The rules, regulations, and criteria governing the ocean disposal of dredged material are contained in Section 227.6 through 228.8 of this publication.

9.71 Response: The statement is in error and the impact statement has been changed by the addition of new data.

9.72 Comment: We also feel further discussion is needed on the practice of disposing on spoil areas such as disposal area 14, Jones Island, and Oysterbed Island with diking only on the channel side. Spoiling in this manner allows the spoil to permeate the marsh area with the coarser materials building up near the main channel. While it has the advantage of leaving the marsh open on one side, materials are not piled as high, and a greater overall area of marsh is degraded than by piling to a higher elevation as in the diked areas. If ocean disposal is to be used eventually, these areas should be diked completely to preserve as much of the marsh as possible.

9.73 Response: Area 14, Jones Island and Oysterbed Island have an estimated capacity to meet the disposal requirements for 100 years at the present shoaling rates. Oysterbed Island, totalling 800 acres, is manmade from dredged material. If dikes were put around these areas at the present time, all of the existing marsh area would be totally destroyed. At the present shoaling rates for several years, very little of the marsh area would be impacted by the deposition of dredged material.

9.74 Comment: 1. Section 2.32, Page 15. A more complete discussion of aquatic resources should be provided. No mention is made of the dominant macrobenthic organisms or the ecological role of the tidal marshes. The source of information for the composition of the planktonic community should be cited. Similarly, in Appendix B, the source of information for each biotic group covered in the biological inventories should be given.

9.75 Response: The Final EIS contains a more complete discussion of aquatic resources. Sources of information have been cited. If EPA has additional data, the Corps will be happy to incorporate such information into this EIS or to issue a supplement containing such data.

9.76 Comment: 2. Section 4.06, Page 21. It would be helpful to know what agency in the proposed program will develop wildlife improvement areas.

9.77 Response: This section has been reworded. There are no funds presently available to develop wildlife improvement areas.

9.78 Comment: 3. Section 5.03, Page 22. It is stated: "Past investigations have shown that benthic organisms destroyed as a result of dredging operations normally repopulate the site two to six months following such dredging." We suggest that literature substantiating this statement should be cited, and the evidence should be summarized.

9.79 Response: This section has been rewritten and literature has been cited.

9.80 Comment: 4. Section 2.23. This section should be expanded to indicate the area of waste storage lagoons emitting sulfuric acid vapor and the amount of sulfuric acid emitted per acre. Also, steps for preventing the escape of fugitive dust from temporary and permanent land storage sites of dredged materials should be outlined.

9.81 Response: Reference to the sulfuric acid vapors has been deleted because changes have been made in plant design to meet the air quality standards. Fugitive dust is not a problem in the Savannah Harbor area.

22

9.82 Georgia Office of Planning and Budget. In a letter dated 25 February 1975, the Office of Planning and Budget furnished the following comments to the Draft Environmental Statement.

9.83 Comment: This department continues to be concerned with the planning void inherent in these activities. Adequate attention should be given to potential interrelating projects, both Corps' and other agencies'. If dredged material could be used effectively elsewhere, actual cost/benefit could be improved.

9.84 Response: See Response 9.27, page 37.

9.85 Comment: This department can offer no objection to this project if it is carried out in such a manner so as not to violate applicable water quality standards, if the activities do not interfere with other legitimate water uses and if the dredging and spoil disposal is performed in accordance with Water Quality Considerations for Construction and Dredging Operations, revised April 1971, Region IV, Water Quality Office, Federal Facilities Branch, Environmental Protection Agency.

9.86 Response: No response required.

9.87 Comment: It is also urged that the Corps of Engineers coordinate this project with the Coastal Marshland Protection Section of the Department of Natural Resources, and that sufficient monitoring data be collected during dredging operations to document the effect on water quality.

9.88 Response: See Section 4.03, page 27.

9.89 Comment: Page 7 - second paragraph, the last sentence regarding data included in Table 2, Page 10, contradicts the recorded data in Table 2.

9.90 Response: The statement is in error and the EIS has been corrected.

9.91 Comment: Data on page 20 is not complete enough for meaningful interpretation. Neither the tide nor the cutterhead depth is recorded.

9.92 Response: The cutterhead depth has been added. Also, Table 8 (page 28) has been added to show turbidity measurements recorded by the Environmental Protection Division of the Georgia Department of Natural Resources.

9.93 Comment: The draft environmental impact statement has not considered the scenic and aesthetic qualities of the river front area. It should be recommended that a visual analysis and visual compatibility study be done to improve the commercial areas adjacent to the city. Also the visual impact will be an important ingredient of any recreational use of the river/harbor.

9.94 Response: See Section 4.07, page 29, for a discussion of the aesthetics of this project.

9.95 Comment: As a result of the review it has been determined that the proposed project is in accord with regional and local plans, programs and objectives as of this date. You should now complete and file your formal application with the appropriate Federal agency(s). A copy of this form must be attached to your application.

9.96 Response: No response required.

9.97 State of South Carolina. In a letter dated 26 February 1975, the Wildlife and Marine Resources Department, Department of Archives and History and the Department of Health and Environmental Control of the State of South Carolina furnished the following comments to the Draft Environmental Statement.

9.98 Wildlife and Marine Resources Department.

9.99 Comment: 1. Allow no more diking of Spartina alterniflora marshland; do not renew temporary easements which are due to expire. (a) Continue to use existing disposal areas by raising the walls and applying mechanical agitation to reduce volume of existing material confined in diked areas. (b) Continue ocean dumping in EPA approved site until further notice. (c) Seek markets for recycled dredge sediments - construction and industrial products.

9.100 Response: The plan is to continue using existing disposal areas by raising the dikes. Ocean dumping in the EPA approved site will be used. The reuse and development of byproducts from river sediments has great potential and the U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, is presently investigating improved disposal techniques and is developing or extracting marketable materials from the sediments.

9.101 Comment: 2. P. 15, Parag. 2.32 - Aquatic resources. Macroscopia should read macroscopic.

9.102 Response: Concur.

9.103 Comment: 3. P. 15-16, Parag. 2.34. Shad and Striped Bass are both spring spawners, neither species ascends rivers to spawn in the fall. This section should include a brief description of the spawning season of the Shad, similar to that presented of the Striped Bass.

9.104 Response: Reference to fall has been deleted. A brief description of the spawning season of the shad has been added.

9.105 Comment: 4. P. 21, Parag. 4.07 - Aquatic resources. Dredging may have an adverse effect on fish migrating into the area to spawn. Dredging should be prohibited during the spawning and early development of important fish species (i.e., Shad, Striped Bass).

9.106 Response: The Corps will restrict its dredging to periods other than February-May as much as possible.

9.107 Comment: Parag. 4.08. Will the use of Disposal Area 12 adversely affect the archeological site in that locality? If so, such operation should be discontinued.

9.108 Response: See Response 9.48, page 40.

9.109 Comment: P. 23, Parag. 6.02 - (Continued use of present sites). Has the Corps considered the mechanical agitation method for compacting confined dredged material? Mechanical agitation of diked dredged material with bulldozers has recently been used successfully to drastically reduce the moisture content of this material, thus making it more stable. Dewatering the material can reduce its volume by as much as 75 percent. With limiting space available for disposal of dredged materials, the present sites can be used more efficiently. After treating the material, the site can be re-used for further dredged material disposal or for other purposes. The treated material is also suitable for use as construction fill making it a useful and manageable resource. Also, this method is made physically stable, thereby reducing the pressure between the walls and the dredged material.

9.110 Response: This paragraph has been deleted from the Final EIS. At this time, the mechanical agitation method is not economically feasible.

9.111 Comment: P. 26, Parag. 9.00. State of South Carolina Wildlife Resources Department, should read Wildlife and Marine Resources Department.

9.112 Response: This correction has been made.

9.113 Comment: Osprey Pandion halioetus carolinensis should be included in the Birds section. Cattail Typha latifolia listed in the Trees section should be placed in the Plants section. Important commercial invertebrates should be included in the Biological Inventories, such as White shrimp, Penaeus setiferus, Brown shrimp, Penaeus aztecus, and Blue Crab, Callinectes sapidus.

9.114 Response: The osprey has been added to the Birds section and the cattail has been moved to the Plants section. Important commercial invertebrates can be found in Table 5, page 20.

9.115 Department of Archives and History.

9.116 Comment: Several archeological sites, investigated by the U.S.C. Institute of Archeology & Anthropology, could be covered by dredged materials in the proposed disposal areas. The sites are designated 38Ja23, 38Ja24 and 38Ja25. The Institute has worked out an agreement to excavate these sites before spoils are deposited. Neither site has been recommended for the National Register of Historic Places by the Institute. The Appropriate Federal Agency official should decide in consultation with State and local officials whether Section 106 of the National Historic Preservation Act is applicable.

9.117 Response: See Response 9.48, page 40.

9.118 Department of Health and Environmental Control.

9.119 Comment: Recommend adoption of options 6.03 and 6.04 at earliest practicable moment.

9.120 Response: The recycling of dredged sediments is still under study. Ocean dumping of all the dredged sediments is not economically feasible at this time.

9.121 State of South Carolina Water Resources Commission. In a letter dated 4 March 1975, the Water Resources Commission furnished the following comments to the Draft Environmental Statement.

9.122 Comment: About 7200 acres of the existing spoil disposal area for the Savannah dredging project are located in South Carolina. This agency is vitally interested in the protection of wetland areas and we urge continued study to find additional spoil disposal methods which will not cause further destruction of valuable wetlands. Recycling of spoil material should be of high priority. Ocean dumping as a spoil disposal method should also be further studied as this certainly appears a viable alternate to direct wetland destruction.

The South Carolina Water Resources Commission appreciates the opportunity of commenting on this environmental impact statement and offers any assistance which we might provide.

9.123 Response: Agree. The recycling of dredged material should be of high priority. The U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, is presently investigating improved disposal techniques and is developing or extracting marketable materials from the sediments.

9.124 Chatham County-Savannah Metropolitan Planning Commission. In a letter dated 29 January 1975, the Metropolitan Planning Commission furnished the following comments to the Draft Environmental Statement.

9.125 Comment: Our office has reviewed the Draft Environmental Impact Statement for the Operation and Maintenance, Savannah Harbor, and feel that it accurately assess[es] the potential impact to the environment.

We have concluded from our review that the project will not produce any negative environment influence of concern.

The maintenance of the Savannah Harbor is essential for the well-being of the Savannah-Chatham County area, a large segment of the state's economy.

Please accept this letter as MPC endorsement for the Savannah Harbor Operations and Maintenance Program.

9.126 Response: No response required.

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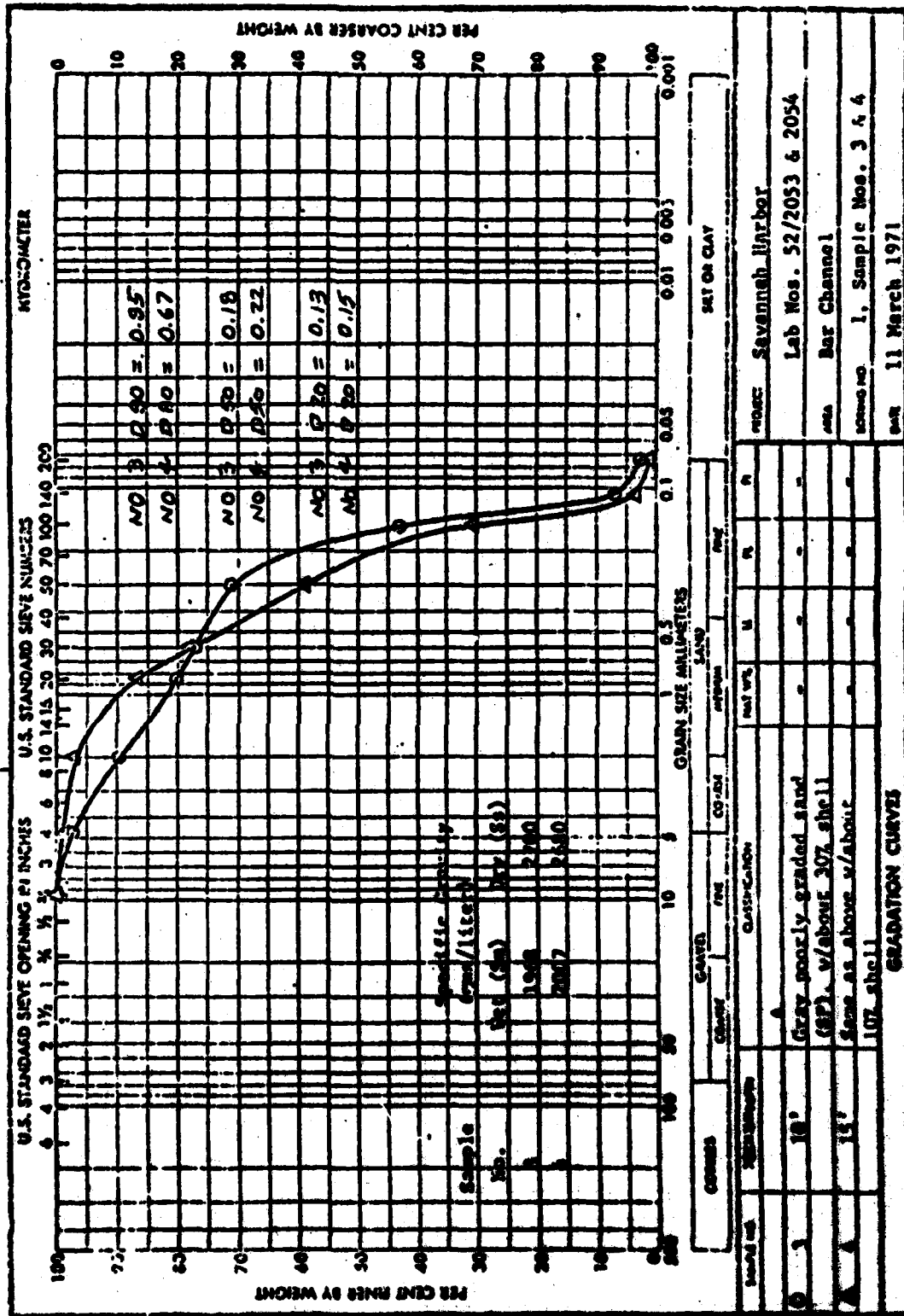
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APPENDIX A

GRADATION CURVES OF SEDIMENTS IN THE BAR CHANNEL

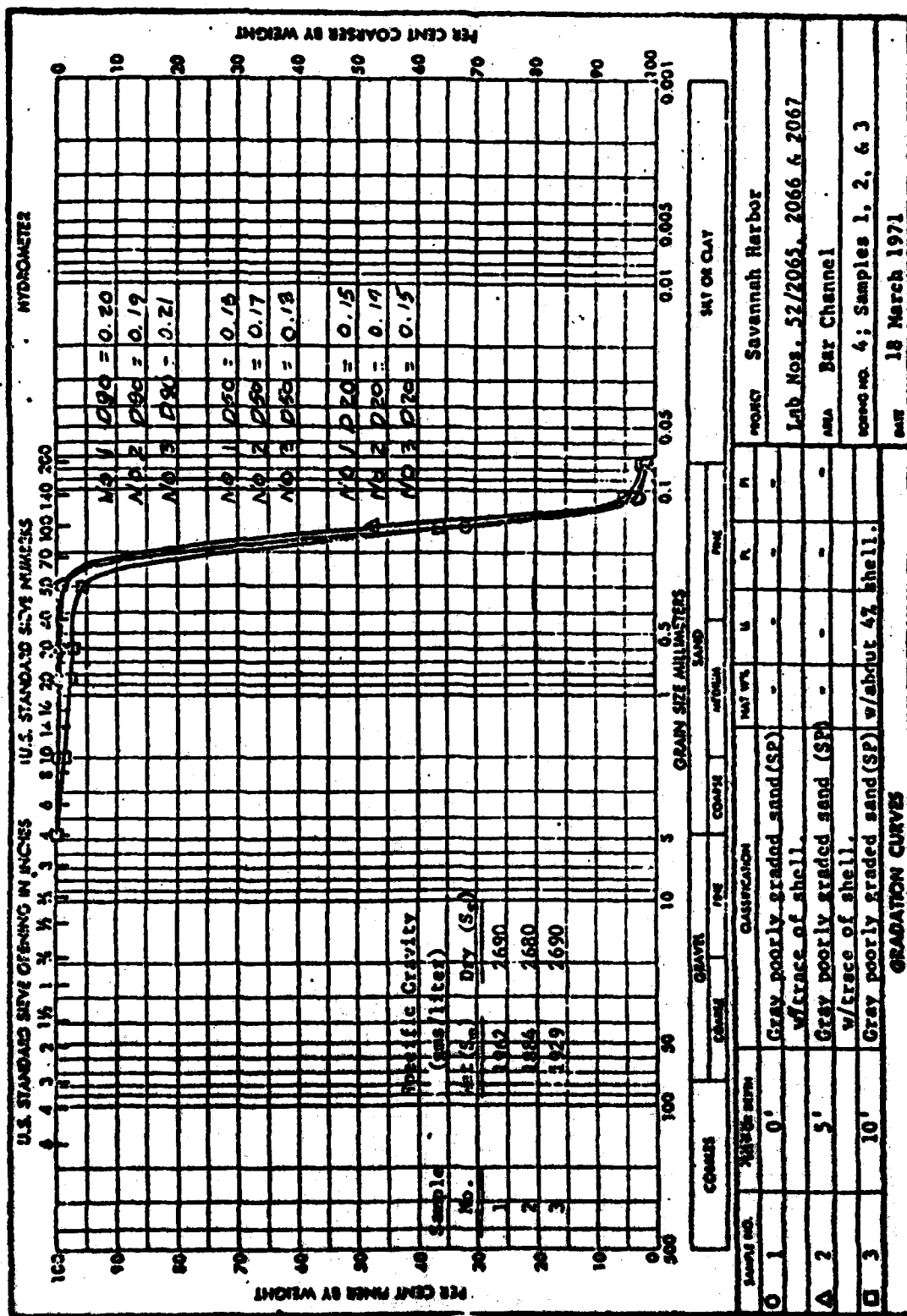
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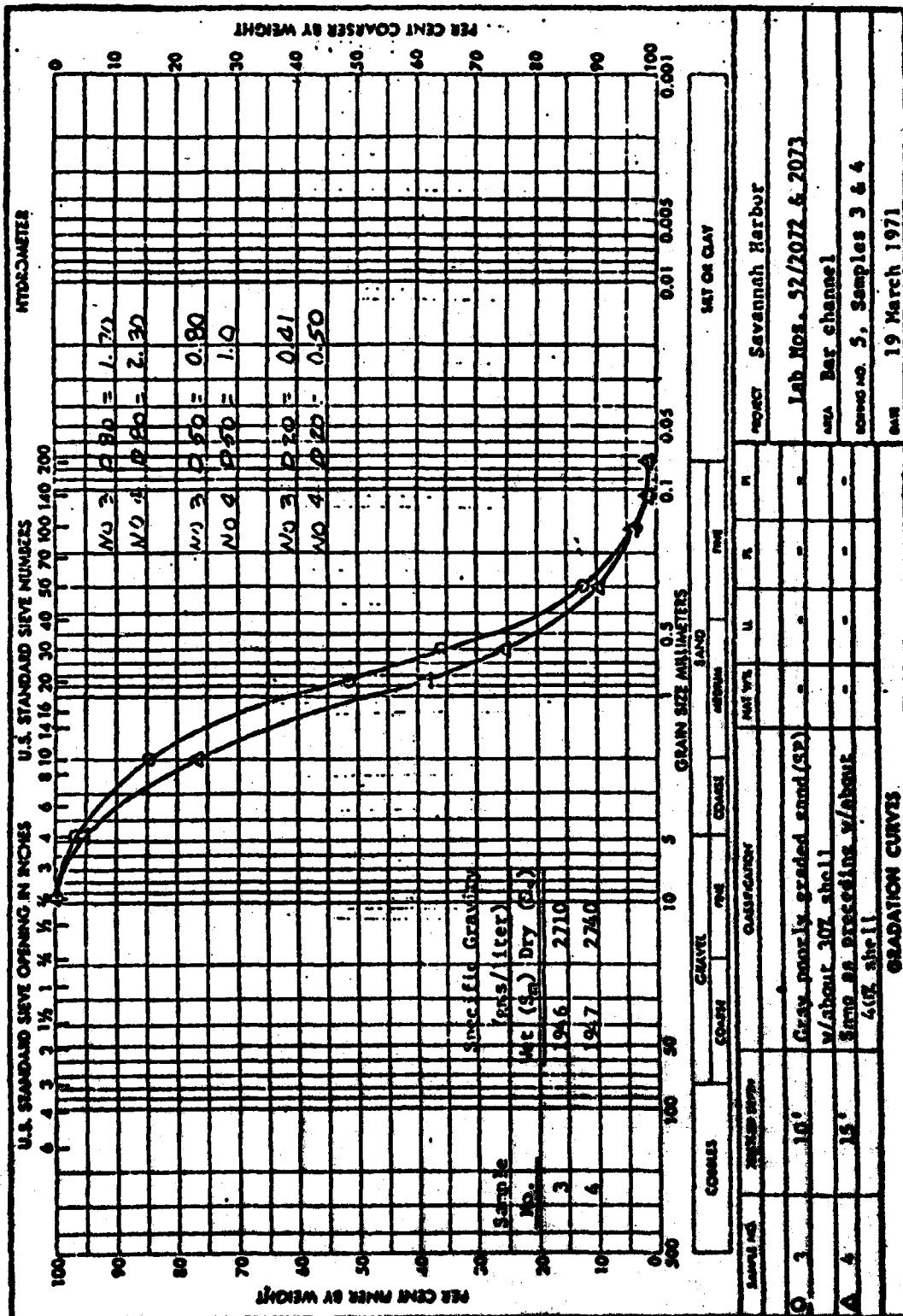


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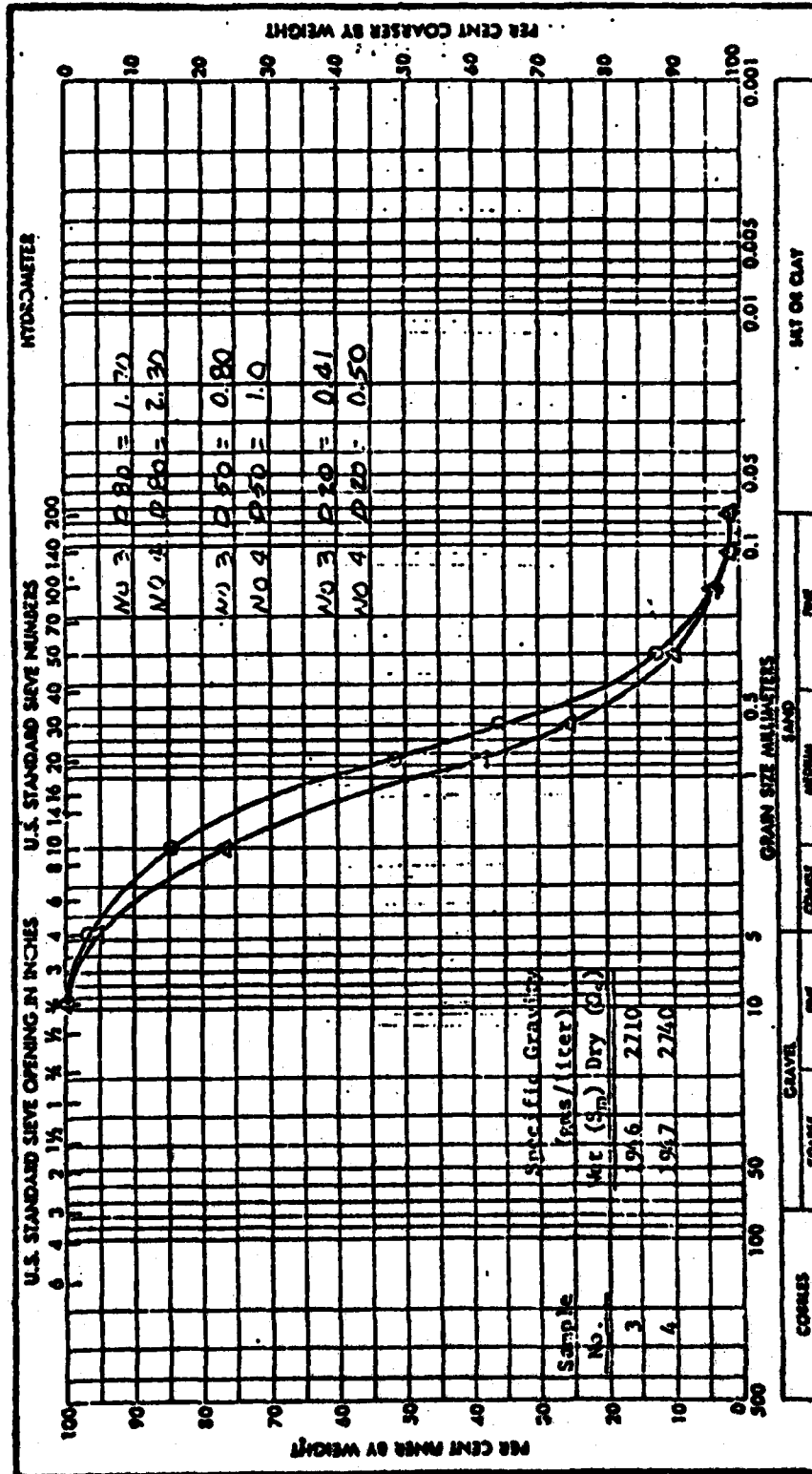
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1 MAY 63

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DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY,
CORPS OF ENGINEERS, 611 SO. COBB DR., MARIETTA, GA. 30060

Reqn. No. SAS-2N-3E-16
Work Order No. 6763



SAMPLE NO.	WATER DEPTH	CLASSIFICATION				GRAIN SIZE ANALYSIS				SOIL OR CLAY			
		COARSE	GRAVEL	FINE	COARSE	FINE	COARSE	FINE	COARSE	FINE	COARSE	FINE	COARSE
3	10'												
4	15'												

Lab Nos. 52/2072 & 2073
Bar channel
Samples 3 & 4
19 March 1971

2087
1 MAR 80

U.S. GOVERNMENT PRINTING OFFICE: 1967 O-288-141

APPENDIX B

STATE OF GEORGIA WATER QUALITY CRITERIA

APPENDIX B

The State of Georgia, Department of Natural Resources, has determined that the following criteria are required for the specific water usage:

(1) Drinking Water Supplies -

(a) Those waters approved by the Georgia Department of Public Health and requiring only approved disinfection and meeting the requirements of the latest edition of "Public Health Service Drinking Water Standards"; or waters approved by the Georgia Department of Public Health for human consumption and food-processing or for any other use requiring water of a lower quality.

1. Bacteria: Fecal coliform not to exceed a geometric mean of 50 per 100 ml based on at least four samples taken over a 30-day period and not to exceed 200 per 100 ml in more than five percent of the samples in any 90-day period.

2. Floating solids, settleable solids, sludge deposits or any taste, odor or color producing substances: None associated with any waste discharge.

3. Sewage, industrial or other wastes: None.

(b) Those raw water supplies requiring approved treatment to meet the requirements of the Georgia Department of Public Health and the latest edition of "Public Health Service Drinking Water Standards" or which are approved by the Georgia Department of Public Health for human consumption and food-processing; or for any other use requiring water of a lower quality.

1. Bacteria: Fecal coliform not to exceed a geometric mean of 1,000 per 100 ml based on at least four samples taken over a 30-day period and not exceed a maximum of 4,000 per 100 ml.

2. Dissolved Oxygen: A daily average of 6.0 mg/l and no less than 5.0 mg/l at all times for waters designated as trout streams by the State Game and Fish Commission. A daily average of 5.0 mg/l and no less than 4.0 mg/l at all times for waters supporting warm water species of fish.

3. pH: Within the range of 6.0 - 8.5.

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1. Bacteria: Fecal coliform not to exceed a geometric mean of 1,000 per 100 ml based on at least four samples taken over a 30-day period and not exceed a maximum of 4,000 per 100 ml.

2. Dissolved Oxygen: A daily average of 6.0 mg/l and no less than 5.0 mg/l at all times for waters designated as trout streams by the State Game and Fish Commission. A daily average of 5.0 mg/l and no less than 4.0 mg/l at all times for waters supporting warm water species of fish.

3. pH: Within the range of 6.0 - 8.5.

APPENDIX B (CONT'D)

(d) Toxic Wastes, Other Deleterious Materials: None in concentrations that would harm man, fish and game or other beneficial aquatic life.

(e) Temperature: Not to exceed 90°F. At no time is the temperature of the receiving waters to be increased more than 5°F above intake temperature except that in estuarine waters the increase will not be more than 1.5°F. In streams designated as trout or smallmouth bass waters by the State Game and Fish Commission, there shall be no elevation or depression of natural stream temperatures.

(3) Fishing, Propagation of Fish, Shellfish, Game and Other Aquatic Life; or for any other use requiring water of a lower quality.

(a) Dissolved Oxygen: A daily average of 6.0 mg/l and no less than 5.0 mg/l at all times for waters designated as trout streams by the State Game and Fish Commission. A daily average of 5.0 mg/l and no less than 4.0 mg/l at all times for waters supporting warm water species of fish.

(b) pH: Within the range of 6.0 - 8.5.

(c) Bacteria: Fecal Coliform not to exceed a geometric mean of 1,000 per 100 ml based on at least four samples taken over a 30-day period and not exceed a maximum of 4,000 per 100 ml.

(d) Bacteria: (Applicable only to waters designated as approved shellfish harvesting waters by the appropriate State agencies) The requirements will be consistent with those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program.

(e) Temperature: Not to exceed 90°F. At no time is the temperature of the receiving waters to be increased more than 5°F above intake temperature except that in estuarine waters the increase will not be more than 1.5°F. In streams designated as trout or smallmouth bass waters by the State Game and Fish Commission, there shall be no elevation or depression of natural stream temperatures.

(f) Toxic Wastes, Other Deleterious Materials: None in concentrations that would harm man, fish and game or other beneficial aquatic life.

(4) Navigation -

To provide for commercial ship trip traffic and protection of seamen or crews.

APPENDIX B (CONT'D)

- (a) Bacteria: Fecal coliform not to exceed a geometric mean of 5,000 per 100 ml based on at least four samples taken over a 30-day period.
- (b) Dissolved Oxygen: No less than 3.0 mg/l at any time.
- (c) pH: Within the range of 6.0 - 8.5.
- (d) Toxic Substances, Other Deleterious Materials: None in concentrations that would damage vessels, prevent fish survival or otherwise interfere with commercial navigation.
- (e) Temperature: Not to exceed 90°F. At no time is the temperature of the receiving waters to be increased more than 5°F above intake temperature except that in estuarine waters the increase will not be more than 1.5°F. In streams designated as trout or small mouth bass waters by the State Game and Fish Commission, there shall be no elevation or depression of natural stream temperatures.

APPENDIX C

**WATER QUALITY MONITORING DATA
(Environmental Protection Division, 1975)**

SAVANNAH RIVER BASIN

STATION 01015001

LOCATION: Savannah River - U. S. Highway 17, Chatham County

MANAGEMENT UNIT: 0192 - Savannah River from U. S. Highway 301 to mouth

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Drinking Water

TYPE OF STATION: Routine chemical

PERIOD OF RECORD: 02/01/68 to date

COOPERATING AGENCY: United States Army Corps of Engineers

NOTES: This station is located near the upper end of the Savannah River estuary. At times, salt water reaches this location. U. S. Highway 17 is upstream from all major municipal and industrial discharges in the Savannah area.

WATER QUALITY ASSESSMENT: The waters were of slightly lower quality than at Clio. Nutrients, although low, were elevated above background levels. Very little organic or oxygen demanding materials were present. Fecal coliform densities ranged from low to moderate. The waters of the Savannah River at U. S. Highway 17 were of good quality.

VIOLATIONS: The maximum one-time fecal coliform density of 4,000/100 ml was exceeded for three of the ten samples taken.

CHANGES: Dissolved oxygen concentrations during the warm weather months were higher than during the previous year. There were no other changes. The over-all water quality has improved slightly.

SAVANNAH RIVER BASIN
STATION 01013001
SAVANNAH RIVER - U.S. HIGHWAY 17

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICRONHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00400)
01/15/74	1454	02	13.0	68	7.9	6.8	- - -
02/05/74	1000	02	15.2	- - -	- - -	6.5	- - -
03/12/74	1502	02	19.3	65	6.3	6.7	- - -
04/11/74	0930	02	15.9	62	7.6	6.8	- - -
05/07/74	0930	02	22.1	176	5.3	6.8	- - -
06/04/74	0946	02	23.9	100	5.7	6.7	0.0
07/02/74	0940	02	26.0	207	5.5	6.8	- - -
08/13/74	1505	02	25.7	95	5.7	6.6	0.0
09/03/74	1330	02	27.3	90	5.7	6.7	0.0
11/05/74	1320	02	21.2	3,000	6.4	6.9	2.7
12/04/74	0935	02	10.2	1,000	9.1	6.9	0.8

DATE	LAB IDENT NUMBER (00008)	TURN JWSN JTW (00070)	COLOR PT-CO UNITS (00080)	CONDUCTVY AT 25C MICRONHO (00095)	DO S DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NPLT MG/L (00530)
01/15/74	000131	- - -	- - -	- - -	1.3	6.5	17	18
02/05/74	000330	- - -	- - -	- - -	1.2	7.0	18	25
03/12/74	000672	- - -	- - -	- - -	0.8	7.1	20	10
04/11/74	000854	- - -	- - -	- - -	1.0	6.9	18	23
05/07/74	001087	- - -	- - -	- - -	0.9	7.0	22	40
06/04/74	001267	- - -	- - -	- - -	1.1	6.8	21	15
07/02/74	001497	25	40	190	0.6	7.1	21	28
08/13/74	001878	25	40	83	0.7	6.7	14	10
09/03/74	002134	16	40	140	0.3	7.0	18	10
11/05/74	002776	11	10	4,000	0.7	7.2	31	7
12/04/74	002941	28	25	1,300	0.9	7.0	25	90

DATE	NH3-N TOTAL MG/L (00410)	NO2+NO3 N-TOTAL MG/L (00430)	PHOS-T P-MET MG/L (00465)	T ORG C C MG/L (00480)	TOT HARD CAC03 MG/L (00900)	CHLORIDE CL MG/L (00940)	PEC COLI MPRECMBD /100ML (31415)
01/15/74	- - -	- - -	- - -	7.0	- - -	5.2	9,300
02/05/74	- - -	- - -	- - -	- - -	- - -	130.0	930
03/12/74	- - -	- - -	- - -	- - -	- - -	- - -	91
04/11/74	- - -	- - -	- - -	7.0	- - -	5.0	930
05/07/74	0.19	0.28	0.15	8.0	- - -	30.0	430
06/04/74	- - -	- - -	- - -	7.0	- - -	13.0	7,300
07/02/74	0.04	0.29	0.11	5.0	26	- - -	430
08/13/74	0.03	0.23	0.10	8.0	17	9.5	- - -
09/03/74	0.02	0.02	0.08	5.0	- - -	23.0	930
11/05/74	0.11	0.26	0.07	5.0	420	1,200.0	230
12/04/74	0.04	0.22	0.14	6.0	134	30.0	4,300

SAVANNAH RIVER BASIN
STATION 01015001
SAVANNAH RIVER - U.S. NIE

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSANLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTIV AT 25C MICROMHO (00005)	DO MG/L (00300)	PH SU (00400)
01/15/74	1437	02	20.00	12.3	51	8.2	6.8
02/03/74	1810	02	20.00	15.3	70	- - -	6.8
03/12/74	1510	02	20.00	19.3	67	6.4	6.7
04/11/74	0943	02	20.00	15.9	53	7.6	6.7
05/07/74	0940	02	20.00	22.4	172	5.4	6.7
06/04/74	0936	02	20.00	23.9	100	5.7	6.7

DATE	LAB IDENT NUMBER (00000)	DOO S DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T ORG C C MG/L (00600)	CHLORIDE CL MG/L (00940)
01/15/74	000132	0.6	6.5	16	17	4.0	5.0
02/03/74	000331	1.2	- - -	7	33	- - -	260.0
03/12/74	000673	0.7	7.0	19	10	- - -	5.1
04/11/74	000855	0.8	7.1	13	29	6.0	5.0
05/07/74	001088	0.8	7.0	23	72	8.0	36.0
06/04/74	001268	0.8	6.9	21	20	7.0	13.0

SEVANNAH RIVER BASIN

STATION 0101001

LOCATION: Savannah River - Between buoys M14 and M16, Chatham County

MANAGEMENT UNIT: 0102 - Savannah River from U. S. Highway 301 to mouth

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Navigation

TYPE OF STATION: Inactive

PERIOD OF RECORD: 02/01/68 to 07/01/74

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTV AT 25C MICROMHO (00093)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1426	02	13.0	139	7.9	6.8	- - -
02/05/74	1032	02	14.9	1,180	- - -	6.6	0.9
03/12/74	1437	02	19.8	70	6.5	7.1	- - -
04/11/74	1004	02	16.4	80	7.3	6.8	- - -
05/07/74	0958	02	22.9	830	5.0	6.7	0.6
06/04/74	1014	02	24.0	418	5.7	- - -	0.2

DATE	LAB IDENT NUMBER (00000)	DO 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)	FEC COLI MPN/100ML (21615)
01/15/74	000129	0.8	6.7	18	26	6.0	23.0	930
02/05/74	000332	0.9	7.3	22	87	- - -	462.0	23,000
03/12/74	000470	0.7	7.1	20	19	- - -	5.9	91
04/11/74	000856	0.9	7.2	21	63	7.0	13.5	2,300
05/07/74	001009	0.9	7.2	24	64	9.0	235.0	2,300
06/04/74	001269	0.6	7.0	21	13	7.0	87.0	9,300

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSANLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTV AT 25C MICROMHO (00093)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1432	02	20.00	13.0	90	7.9	6.8	- - -
02/05/74	1000	02	20.00	15.4	1,180	- - -	6.7	0.9
03/12/74	1445	02	20.00	19.8	70	6.5	6.7	- - -
04/11/74	1011	02	20.00	16.7	96	7.4	6.8	- - -
05/07/74	1007	02	20.00	22.9	1,000	5.0	6.7	0.7
06/05/74	1020	02	20.00	- - -	300	5.6	- - -	0.5

DATE	LAB IDENT NUMBER (00000)	DO 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)
01/15/74	000130	0.8	6.7	16	30	5.0	19.3
02/05/74	000333	0.9	7.3	22	74	- - -	375.0
03/12/74	000471	0.6	7.1	20	14	- - -	5.8
04/11/74	000857	1.3	7.3	21	64	7.0	18.0
05/07/74	001000	1.2	7.2	26	90	9.0	280.0
06/05/74	001270	0.6	6.9	22	25	6.0	140.0

SAVANNAH RIVER BASIN

STATION 01210001

LOCATION: Savannah River - Savannah Machine and Foundry, Chatham County

MANAGEMENT UNIT: 0192 - Savannah River from U. S. Highway 301 to mouth

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Navigation

TYPE OF STATION: Inactive

PERIOD OF RECORD: 02/01/68 to 07/01/74

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTV AT 25C MICRONHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1401	02	13.5	1,800	7.5	6.8	- - -
02/05/74	1055	02	15.6	3,300	- - -	6.8	3.9
03/12/74	1415	02	19.8	89	6.4	6.4	- - -
04/11/74	1032	02	17.3	1,900	6.5	6.5	1.4
05/07/74	1025	02	23.0	6,900	3.9	6.4	4.2
06/04/74	1032	02	24.4	4,030	4.7	6.7	2.7

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)	FEC COLI MPNECRED /100ML (31615)
01/15/74	000127	0.9	7.1	22	43	4.0	688.0	7,300
02/05/74	000334	0.7	7.4	31	39	- - -	2,150.0	4,300
03/12/74	000648	0.5	7.0	22	18	- - -	11.0	920
04/11/74	000858	0.5	7.2	21	88	7.0	620.0	230,000
05/07/74	001091	0.6	7.2	31	64	6.0	2,450.0	4,300
06/04/74	001271	0.4	7.1	27	16	5.0	1,400.0	7,500

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSANLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTV AT 25C MICRONHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1408	02	20.00	13.5	2,710	7.5	6.9	- - -
02/05/74	1059	02	20.00	15.7	6,500	- - -	6.8	4.7
03/12/74	1425	02	20.00	19.8	89	6.4	6.7	- - -
04/11/74	1037	02	20.00	17.5	3,000	6.1	6.5	2.2
05/07/74	1033	02	20.00	23.0	8,100	4.0	6.4	5.0
06/04/74	1039	02	20.00	24.6	7,400	4.0	6.7	4.4

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)
01/15/74	000128	0.8	7.1	25	42	6.0	1,170.0
02/05/74	000335	1.2	7.5	33	100	- - -	- - -
03/12/74	000649	0.4	7.0	21	12	- - -	11.0
04/11/74	000859	0.6	7.2	23	124	9.0	1,890.0
05/07/74	001092	1.1	7.1	33	64	7.0	2,730.0
06/04/74	001272	0.6	7.0	31	19	5.0	2,800.0

SAVANNAH RIVER BASIN

STATION 01019001

LOCATION: Savannah River - Opposite Savannah City Hall, Chatham County

MANAGEMENT UNIT: 0192 - Savannah River from U. S. Highway 301 to mouth

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Navigation

TYPE OF STATION: Inactive

PERIOD OF RECORD: 02/01/68 to 07/01/74

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICROHMS (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00400)
01/15/74	1345	02	13.5	1,390	7.8	6.8	- - -
02/05/74	1120	02	13.8	7,100	- - -	6.9	30.0
03/12/74		02	19.9	243	6.4	6.6	6.1
04/11/74	1050	02	17.5	3,490	6.1	6.1	2.7
05/07/74	1044	02	23.2	6,300	3.4	6.6	5.0
06/04/74	1052	02	24.5	5,700	4.5	6.7	3.3

DATE	LAB IDENT NUMBER (00000)	DO 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T OPG C C MG/L (00600)	CHLORIDE CL MG/L (00940)	FEC SOLI MPHCHED /100ML (31615)
01/15/74	000125	0.6	7.0	21	43	6.0	485.0	9,300
02/05/74	000336	0.9	7.5	35	84	- - -	2,900.0	4,300
03/12/74	000466	0.5	7.2	18	- - -	- - -	66.0	930
04/11/74	000840	0.4	6.8	15	62	9.0	1,075.0	23,000
05/07/74	001093	0.6	7.1	31	34	5.0	2,750.0	2,300
06/04/74	001273	0.4	7.0	27	19	5.0	1,900.0	2,300

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSARLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICROHMS (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00400)
01/15/74	1351	02	20.00	13.5	6,100	7.4	7.0	- - -
02/05/74	1120	02	20.00	13.8	7,000	- - -	6.9	15.3
03/12/74	1404	02	20.00	19.8	233	6.4	6.6	6.1
04/11/74	1057	02	20.00	17.7	5,100	6.2	6.3	3.5
05/07/74	1051	02	20.00	23.0	11,700	4.2	6.6	7.2
06/04/74	1059	02	20.00	24.8	9,900	3.6	6.7	5.9

DATE	LAB IDENT NUMBER (00000)	DO 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T OPG C C MG/L (00600)	CHLORIDE CL MG/L (00940)
01/15/74	000126	0.7	7.3	32	47	6.0	2,475.0
02/05/74	000337	1.0	7.5	35	136	- - -	3,000.0
03/12/74	000467	0.4	7.2	19	18	- - -	52.0
04/11/74	000841	0.4	7.2	25	246	5.0	1,050.0
05/07/74	001094	0.6	7.2	39	30	5.0	4,330.0
06/04/74	001274	0.5	7.0	34	12	5.0	3,600.0

SAVANNAH RIVER BASIN

STATION 0100000

LOCATION: Savannah River - Mouth of Back River, Chatham County

MANAGEMENT UNIT: 0192 - Savannah River from U. S. Highway 301 to mouth

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Navigation

TYPE OF STATION: Inactive

PERIOD OF RECORD: 02/01/68 to 07/01/74

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICRONHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1204	02	13.5	2,120	7.5	6.9	- - -
02/05/74	1309	02	15.5	4,450	- - -	7.0	3.4
03/12/74		02	20.1	340	6.4	6.3	8.2
04/11/74	1225	02	18.0	2,500	6.6	6.8	1.8
05/07/74	1218	02	23.4	4,300	6.7	6.7	2.8
06/04/74	1229	02	24.6	2,950	6.1	6.9	2.0

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T OPG C C MG/L (00680)	CHLORIDE CL MG/L (00940)	FEC COLI MPN/100ML (31615)
01/15/74	000123	0.8	7.0	24	43	6.0	845.0	23,000
02/05/74	000338	0.6	7.3	28	22	- - -	1,575.0	2,300
03/12/74	000664	- - -	7.0	18	- - -	- - -	142.0	4,300
04/11/74	000862	0.5	7.2	24	50	6.0	810.0	23,000
05/07/74	001095	0.8	7.3	28	16	5.0	1,460.0	7,300
06/04/74	001275	0.5	7.3	27	12	5.0	890.0	3,900

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSANLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICRONHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1210	02	20.00	14.5	12,000	6.1	7.2	- - -
02/05/74	1313	02	20.00	16.0	18,300	- - -	7.4	13.5
03/12/74		02	20.00	19.3	3,150	6.0	6.7	2.1
04/11/74	1230	02	20.00	17.4	10,700	6.1	6.9	7.2
05/07/74	1225	02	20.00	23.2	13,300	5.9	6.8	8.2
06/04/74	1235	02	20.00	25.2	17,000	5.5	7.0	10.1

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T OPG C C MG/L (00680)	CHLORIDE CL MG/L (00940)
01/15/74	000124	0.7	7.3	48	38	4.0	3,530.0
02/05/74	000339	0.7	7.8	64	23	- - -	8,700.0
03/12/74	000665	0.5	7.4	26	- - -	- - -	900.0
04/11/74	000863	0.7	7.7	40	27	4.0	4,500.0
05/07/74	001096	0.5	7.4	44	23	5.0	3,200.0
06/04/74	001276	0.7	7.4	52	9	4.0	6,600.0

SAVANNAH RIVER BASIN

STATION 01021001

LOCATION: Savannah River - Fort Jackson, Chatham County

MANAGEMENT UNIT: 0192 - Savannah River from U. S. Highway 301 to mouth

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Navigation

TYPE OF STATION: Routine chemical

PERIOD OF RECORD: 11/01/69 to date

COOPERATING AGENCY: United States Army Corps of Engineers

NOTES: This location is within the Savannah River estuary downstream from most wastewater sources in the area and near the oxygen sag point. A large variety and volume of wastewaters from municipal and industrial sources are discharged into Savannah Harbor.

WATER QUALITY ASSESSMENT: The Savannah River at Fort Jackson was degraded. Dissolved oxygen concentrations were greatly depressed. One concentration of 3.2 mg/l was near the lower limit specified for navigational waters. Ammonia nitrogen concentrations were high two times and fecal coliform densities confirmed pollution of the harbor by domestic wastewaters.

VIOLATIONS: There were no violations of water quality criteria for navigational waters.

CHANGES: There were no significant changes.

SAVANNAH RIVER BASIN
STATION 01021001
SAVANNAH RIVER - FORT JACKSON

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICROMHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1140	02	13.5	2,140	7.5	6.9	- - -
02/05/74	1325	02	16.0	3,700	- - -	6.9	3.9
03/12/74		02	20.0	600	6.4	6.4	0.3
04/10/74	1245	02	18.6	4,620	6.1	6.6	3.3
05/07/74	1236	02	23.5	9,900	3.9	6.6	6.0
06/04/74	1245	02	24.8	6,900	5.4	6.7	4.0
07/02/74	1235	02	27.0	9,000	3.2	6.7	- - -
08/13/74	1142	02	26.3	2,030	4.3	6.7	1.3
09/03/74	1107	02	28.9	10,200	4.2	6.8	5.8
11/03/74	1102	02	20.8	14,700	5.6	6.8	9.3
12/04/74	1053	02	11.1	12,500	7.8	7.1	9.9

DATE	LAB IDENT NUMBER (00008)	TURB JKSN JTU (00070)	COLOR PT-CO UNITS (00080)	CONDUCTVY AT 25C MICROMHO (00095)	DO 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NPLT MG/L (00530)
01/15/74	000121	- - -	- - -	- - -	0.7	7.0	24	48
02/05/74	000340	- - -	- - -	- - -	1.5	7.3	33	226
03/12/74	000662	- - -	- - -	- - -	0.5	7.1	14	- - -
04/10/74	000864	- - -	- - -	- - -	0.4	7.3	24	23
05/07/74	001097	- - -	- - -	- - -	0.5	7.2	33	27
06/04/74	001277	- - -	- - -	- - -	0.7	7.2	30	27
07/02/74	001498	42	20	6,000	0.8	7.1	31	150
08/13/74	001879	25	70	1,850	0.7	7.0	23	37
09/03/74	002135	13	20	9,780	0.1	7.2	34	17
11/03/74	002774	16	<5	15,800	1.1	7.1	48	25
12/04/74	002942	28	8	18,000	0.5	7.1	50	106

DATE	NH3-N TOTAL MG/L (00610)	NO2+NO3 N-TOTAL MG/L (00630)	PHOS-T P-MET MG/L (00665)	T ORG C C MG/L (00680)	TOT HARD CAC03 MG/L (00900)	CHLORIDE CL MG/L (00940)	PEC COLI MPNECRED /100ML (31615)
01/15/74	- - -	- - -	- - -	7.0	- - -	826.0	150,000
02/05/74	- - -	- - -	- - -	- - -	- - -	1,950.0	9,300
03/12/74	- - -	- - -	- - -	- - -	- - -	173.0	7,500
04/10/74	- - -	- - -	- - -	6.0	- - -	1,750.0	75,000
05/07/74	0.10	0.24	0.09	4.0	- - -	3,600.0	9,300
06/04/74	- - -	- - -	- - -	6.0	- - -	2,200.0	230,000
07/02/74	0.07	0.36	0.19	7.0	790	2,500.0	93,000
08/13/74	0.08	0.26	0.14	10.0	187	340.0	- - -
09/03/74	0.05	0.32	0.06	5.0	- - -	3,200.0	15,000
11/03/74	0.23	0.21	0.07	6.0	1,800	5,400.0	930
12/04/74	0.31	0.22	0.15	6.0	1,900	6,400.0	23,000

SAVANNAH RIVER BASIN
STATION 01021001
SAVANNAH RIVER - FOOT JACKSON

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSANLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICRONHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1149	02	20.00	13.5	5,000	7.6	7.0	- - -
02/05/74	1332	02	20.00	15.9	- - -	- - -	7.3	4.0
03/12/74		02	20.00	19.6	3,760	6.1	6.7	2.7
04/10/74	1247	02	20.00	18.4	16,700	6.4	7.1	11.2
05/07/74	1243	02	20.00	23.4	13,800	3.5	6.7	8.6
06/04/74	1252	02	20.00	24.9	9,000	4.2	6.8	5.2
07/02/74	1244	02	20.00	27.0	12,700	2.9	6.7	- - -
08/13/74	1146	02	20.00	26.4	4,320	4.1	6.7	2.8
09/03/74	1126	02	20.00	28.9	24,100	3.7	6.9	13.8
11/05/74	1128	02	20.00	20.8	16,900	5.6	6.9	11.0
12/04/74	1105	02	20.00	11.0	15,000	7.9	7.2	12.0

DATE	LAB IDENT NUMBER (00008)	TURB JKSN JTU (00070)	COLOR PT-CO UNIT2 (00080)	CONDUCTVY AT 25C MICRONHO (00095)	DOB 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)
01/15/74	000122	- - -	- - -	- - -	0.8	7.0	31	44
02/05/74	000341	- - -	- - -	- - -	2.2	7.3	36	370
03/12/74	000663	- - -	- - -	- - -	0.4	7.3	27	- - -
04/10/74	000865	- - -	- - -	- - -	0.1	7.6	49	22
05/07/74	001098	- - -	- - -	- - -	0.4	7.3	41	44
06/04/74	001278	- - -	- - -	- - -	0.6	7.4	35	30
07/02/74	001499	63	20	7,500	1.2	7.1	35	158
08/13/74	001880	32	60	3,650	0.7	7.0	27	56
09/03/74	002136	10	8	21,700	40.1	7.5	59	15
11/05/74	002775	18	45	20,000	1.4	7.3	55	33
12/04/74	002943	84	10	21,500	1.1	7.3	60	290

DATE	NH3-N TOTAL MG/L (00610)	NO2+NO3 N-TOTAL MG/L (00630)	PHOS-T P-VET MG/L (00665)	T ORG C C MG/L (00680)	TOT HARD CAC03 MG/L (00900)	CHLORIDE CL MG/L (00940)
01/15/74	- - -	- - -	- - -	4.0	- - -	2,225.0
02/05/74	- - -	- - -	- - -	- - -	- - -	2,050.0
03/12/74	- - -	- - -	- - -	- - -	- - -	1,650.0
04/10/74	- - -	- - -	- - -	4.0	- - -	6,350.0
05/07/74	0.10	0.21	0.29	5.0	- - -	5,150.0
06/04/74	- - -	- - -	- - -	6.0	- - -	3,300.0
07/02/74	0.09	0.39	0.35	10.0	1,100	3,400.0
08/13/74	0.09	0.26	0.16	10.0	412	1,250.0
09/03/74	0.07	0.18	0.05	4.0	- - -	8,550.0
11/05/74	0.18	0.19	0.07	4.0	2,280	7,100.0
12/04/74	0.26	0.20	1.04	9.0	2,580	7,500.0

SAVANNAH RIVER BASIN

STATION 01023001

LOCATION: Savannah River - Opposite entrance to South Channel, Chatham County

MANAGEMENT UNIT: 0192 - Savannah River from U. S. Highway 301 to mouth

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Navigation

TYPE OF STATION: Inactive

PERIOD OF RECORD: 02/01/68 to 07/01/74

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICROMHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)	
01/15/74	1130	02	13.5	2,970	7.6	6.8	- - -	
02/05/74	1344	02	16.0	5,900	- - -	6.9	- - -	
03/12/74	1126	02	19.9	1,080	6.5	6.8	0.8	
04/10/74	1305	02	18.5	7,000	6.4	6.7	4.7	
05/07/74	1256	02	23.5	10,000	3.8	6.6	6.1	
06/04/74	1306	02	24.9	8,000	4.6	6.8	4.8	

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CACO3 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)	FEC COLI MPN/100ML (31615)
01/15/74	000119	0.6	7.0	25	42	6.0	1,150.0	3,900
02/05/74	000342	0.9	6.9	34	95	- - -	2,438.0	9,300
03/12/74	000659	0.5	7.2	22	- - -	- - -	303.0	- - -
04/10/74	000366	0.2	7.5	29	24	5.0	2,400.0	15,000
05/07/74	001100	0.6	7.3	34	27	5.0	3,800.0	9,300
06/04/74	001279	0.6	7.3	32	31	6.0	2,700.0	150,000

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSANLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICROMHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1137	02	20.00	13.5	9,000	7.2	7.1	- - -
02/05/74	1353	02	20.00	15.7	7,200	- - -	6.9	5.1
03/12/74	1132	02	20.00	19.4	5,500	6.1	6.8	3.5
04/10/74	1310	02	20.00	18.4	17,100	6.5	7.2	11.9
05/07/74	1304	02	20.00	23.1	16,300	3.9	6.8	10.0
06/04/74	1313	02	20.00	25.1	12,900	3.2	6.8	7.7

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CACO3 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)
01/15/74	000120	0.6	7.3	40	52	- - -	4,000.0
02/05/74	000343	2.7	7.4	41	694	- - -	2,900.0
03/12/74	000660	0.5	7.4	26	- - -	- - -	1,630.0
04/10/74	000867	0.1	7.8	33	21	4.0	7,300.0
05/07/74	001101	0.8	7.4	47	46	5.0	6,100.0
06/04/74	001280	0.9	7.5	45	100	5.0	5,100.0

SAVANNAH RIVER BASIN

STATION 01024001

LOCATION: Rehoboth Creek - 150 feet upstream from Wilmington River,
Chatham County

MANAGEMENT UNIT: 0115 - Savannah Metropolitan area

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Fishing

TYPE OF STATION: Inactive

PERIOD OF RECORD: 09/01/70 to 07/01/74

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTIV AT 25C MICROHMO (00095)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1118	02	14.0	14,500	6.7	- - -
03/12/74	1114	02	19.3	5,100	6.2	3.2
04/10/74	1345	02	19.3	13,300	6.5	8.9
05/07/74	1344	02	23.9	15,500	6.5	9.7
06/04/74	1341	02	23.9	14,900	6.6	8.8

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	PHOS-T P-NET MG/L (00465)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00948)
01/15/74	000135	0.8	6.5	22	30	- - -	4.0	3,900.0
03/12/74	000658	0.4	6.7	12	- - -	- - -	- - -	1,750.0
04/10/74	000870	0.2	7.6	34	14	- - -	5.0	5,200.0
05/07/74	001099	0.8	7.2	38	46	0.14	6.0	5,900.0
06/04/74	001283	1.1	7.3	44	38	- - -	10.0	5,300.0

DATE	IRON TOTAL UG/L (01045)
01/15/74	- - -
03/12/74	2,100
04/10/74	2,100
05/07/74	3,800
06/04/74	2,700

SAVANNAH RIVER BASIN

STATION 01024101

LOCATION: Wilmington River - Mouth of Habersham Creek, Chatham County

MANAGEMENT UNIT: 0115 - Savannah Metropolitan area

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Fishing

TYPE OF STATION: Inactive

PERIOD OF RECORD: 09/01/70 to 07/01/74

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTIV AT 25C MICROMHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1106	02	13.5	8,900	7.1	6.3	- - -
02/05/74	1412	02	16.0	13,700	- - -	6.4	9.8
03/12/74	1100	02	19.5	5,000	6.4	6.3	3.3
04/10/74	1333	02	19.0	13,200	7.0	6.4	9.0
05/07/74	1330	02	23.2	19,200	4.9	6.5	12.1
06/04/74	1327	02	25.4	16,400	5.1	6.6	9.8

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)	IRON TOTAL MG/L (01045)	FEC COLI MPNECHD /100ML (31615)
01/15/74	000133	0.3	6.4	22	5.0	4,000.0	- - -	4,300
02/05/74	000344	0.5	7.3	28	- - -	4,000.0	5,500	9,300
03/12/74	000636	0.8	7.0	19	- - -	1,800.0	2,000	4,300
04/10/74	000868	0.4	7.3	33	5.0	5,300.0	1,400	4,300
05/07/74	001102	0.9	7.2	42	4.0	7,450.0	1,400	750
06/04/74	001281	0.7	7.1	38	4.0	6,100.0	750	950

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSAMLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTIV AT 25C MICROMHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1112	02	20.00	14.0	14,500	7.6	6.7	- - -
02/05/74	1420	02	15.00	16.1	13,300	- - -	6.4	4.5
03/12/74	1106	02	20.00	19.3	5,700	6.1	6.4	3.8
04/10/74	1339	02	20.00	18.6	22,700	6.8	7.1	16.8
05/07/74	1336	02	20.00	23.0	21,800	4.5	6.6	14.8
06/04/74	1335	02	20.00	25.8	23,200	4.1	6.9	14.8

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)	IRON TOTAL MG/L (01045)
01/15/74	000134	0.8	7.0	43	4.0	7,100.0	- - -
02/05/74	000345	0.7	6.8	28	- - -	5,800.0	5,900
03/12/74	000637	0.3	6.7	21	- - -	1,925.0	2,000
04/10/74	000869	0.3	7.7	62	5.0	9,900.0	1,500
05/07/74	001103	0.9	7.4	51	4.0	8,800.0	1,200
06/04/74	001282	0.7	7.4	58	9.0	8,900.0	1,100

SAVANNAH RIVER BASIN

STATION 01025001

LOCATION: Savannah River - Lower Flats Range near Fields Out, Chatham County

MANAGEMENT UNIT: 0102 - Savannah River from U. S. Highway 301 to mouth

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Fishing

TYPE OF STATION: Inactive

PERIOD OF RECORD: 02/01/68 to 07/01/74

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTV AT 25C MICRONHO (00093)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00400)
01/15/74	1045	02	13.5	8,400	7.4	7.0	- - -
02/03/74	1438	02	16.1	12,400	- - -	7.1	8.9
03/12/74	1033	02	19.0	9,400	6.3	7.0	6.2
04/10/74	1404	02	18.8	13,000	7.0	7.1	10.3
05/07/74	1405	02	23.4	14,500	4.2	6.8	8.9
06/04/74	1358	02	25.1	11,400	4.4	6.9	6.7

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T DPG C C MG/L (00480)	CHLORIDE CL MG/L (00940)	FEC COLI MPNECMED /100ML (31615)
01/15/74	000117	1.1	7.2	37	34	4.0	3,850.0	4,300
02/03/74	000348	0.7	7.6	46	25	- - -	- - -	1,500
03/12/74	000654	0.3	7.4	38	18	- - -	3,750.0	2,300
04/10/74	000871	0.3	7.7	45	16	5.0	6,000.0	2,100
05/07/74	001104	0.7	7.3	43	27	4.0	5,300.0	2,300
06/04/74	001284	0.6	7.3	38	15	7.0	4,100.0	2,300

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSANLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTV AT 25C MICRONHO (00093)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00400)
01/15/74	1049	02	20.00	13.5	14,300	7.4	7.2	- - -
02/03/74	1446	02	20.00	16.0	14,300	- - -	7.2	10.3
03/12/74	1038	02	20.00	18.8	12,300	6.4	7.1	- - -
04/10/74	1412	02	20.00	18.4	22,200	7.0	7.3	12.9
05/07/74	1415	02	20.00	23.0	20,300	4.6	7.0	12.9
06/04/74	1405	02	20.00	25.4	19,800	3.9	7.1	11.9

DATE	LAB IDENT NUMBER (00008)	BOD 5 DAY MG/L (00310)	LAB PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00530)	T DPG C C MG/L (00480)	CHLORIDE CL MG/L (00940)
01/15/74	000118	0.9	7.5	53	40	4.0	7,100.0
02/03/74	000347	0.7	7.7	50	42	- - -	6,400.0
03/12/74	000655	0.9	7.8	44	112	- - -	10,500.0
04/10/74	000872	0.2	7.8	48	30	5.0	9,700.0
05/07/74	001105	1.5	7.6	59	34	5.0	8,200.0
06/04/74	001285	0.8	7.5	55	31	12.0	7,500.0

SAVANNAH RIVER BASIN

STATION 01024001

LOCATION: Savannah River - Crossing Range near busy R28, Chatham County

MANAGEMENT UNIT: 0192 - Savannah River from U. S. Highway 301 to south

GEOLOGICAL PROVINCE: Coastal Plain

CLASSIFICATION: Fishing

TYPE OF STATION: Inactive

PERIOD OF RECORD: 02/01/68 to 07/01/74

SURFACE SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICRONHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1016	02	13.5	9,800	7.4	7.1	- - -
02/05/74	1500	02	16.1	15,700	- - -	7.2	11.2
03/12/74	1008	02	18.9	10,300	6.4	7.0	- - -
04/10/74	1436	02	18.3	18,300	7.3	7.4	12.8
05/07/74	1431	02	23.2	17,800	4.6	6.9	11.2

DATE	LAD IDENT NUMBER (00008)	DO 5 DAY MG/L (00310)	LAD PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00570)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)	FEC COLI MPNECHD /100ML (31615)
01/15/74	000115	1.9	7.3	44	35	5.0	4,900.0	4,300
02/05/74	000348	0.7	7.7	34	18	- - -	6,900.0	2,300
03/12/74	000652	0.5	7.4	40	12	- - -	4,150.0	4,300
04/10/74	000873	0.2	7.7	57	12	5.0	7,800.0	2,300
05/07/74	001106	0.7	7.5	53	32	4.0	7,150.0	4,300

DEEP-WATER SAMPLES

DATE	TIME	COLLECT AGENCY CODE (00027)	VSANLOC DEPTH FEET (00003)	WATER TEMP CENT (00010)	CONDUCTVY AT 25C MICRONHO (00095)	DO MG/L (00300)	PH SU (00400)	SALINITY PPTH (00480)
01/15/74	1022	02	20.00	13.5	18,000	7.8	7.6	- - -
02/05/74	1507	02	20.00	16.0	17,900	- - -	7.3	13.2
03/12/74	1017	02	20.00	18.2	22,900	7.1	7.8	18.3
04/10/74	1443	02	20.00	18.1	27,000	7.2	7.8	19.7
05/07/74	1440	02	20.00	22.9	22,800	4.8	7.1	14.7

DATE	LAD IDENT NUMBER (00008)	DO 5 DAY MG/L (00310)	LAD PH SU (00403)	T ALK CAC03 MG/L (00410)	RESIDUE TOT NFLT MG/L (00570)	T ORG C C MG/L (00680)	CHLORIDE CL MG/L (00940)
01/15/74	000116	0.9	7.8	68	39	4.0	9,900.0
02/05/74	000349	0.7	7.7	38	30	- - -	8,200.0
03/12/74	000653	0.7	8.0	78	- - -	- - -	- - -
04/10/74	000874	0.1	8.0	91	33	8.0	12,500.0
05/07/74	001107	1.7	7.7	63	64	6.0	9,200.0

APPENDIX D

**BIOLOGICAL INVENTORIES
(Cooley, 1974)**

BIRDS

<u>Species</u>	<u>Habitat and/or Seasonal Status</u>	<u>Range in Region or State</u>	<u>Abundance In Region</u>	<u>Range in U.S.</u>	<u>Project Impact</u>
Mallard Duck <u>Anas platyrhynchos</u>	Migrant	Waterways and Marsh area regionwide	Common	U.S.	None
Ring-necked Duck <u>Aythya collaris</u>	Migrant	Regionwide Wooded lakes Waterways	Common	U.S.	None
Green-winged Teal <u>Anas carolinensis</u>	Migrant	Regionwide Marsh Areas	Common	U.S.	None
Blue-winged Teal <u>Anas discors</u>	Migrant	Regional Marsh Areas	Uncommon	U.S.	None
Widgeon <u>Marca americana</u>	Migrant	Regional Ponds and Bays	Uncommon	U.S.	None
Shoveler <u>Spatula clypeata</u>	Migrant	Regional Ponds and Marshes	Uncommon	U.S.	None
Gadwall <u>Anas strepera</u>	Migrant	Regional Waterways	Occasional	U.S.	None
Pintails <u>Anas acuta</u>	Migrant	Regional Ponds and Marshes	Uncommon	U.S.	None
Coots <u>Fulica americana</u>	Resident	Regional Waterways Marsh	Common	U.S.	None
Gallinules <u>Porphyryula martinica</u>	Resident	Regional Lowlands Swamp Waterways	Common	South- east Occa- sionally North	None
Canada Geese <u>Branta canadensis</u>	Migrant	Regional Waterways	Occasional	North America	None
Snow Geese <u>Chen hyperborea</u>	Migrant	Regional Coastal Waterways	Occasional	Mid to E. North America	None
Osprey <u>Pandion haliaetus carolinensis</u>	Resident	Regional Waterways	Occasional	U.S.	None

BIRDS (Cont'd)

<u>Species</u>	<u>Habitat and/or Seasonal Status</u>	<u>Range in Region or State</u>	<u>Abundance In Region</u>	<u>Range in U.S.</u>	<u>Project Impact</u>
Blue Geese <u>Chen caerulescens</u>	Migrant	Regional Coastal Waterways	Rare	Mid to E. North America	None
Piedbilled Grebe <u>Podilymbus podiceps</u>	Migrant	Regional Marshes Waterways	Common	Eastern North America	None
Great Blue Heron <u>Ardea herodias</u>	Resident	Regional Waterways	Common	Eastern North America	None
Little Blue Heron <u>Florida caerulea</u>	Resident	Regional Waterways	Common	South and Eastern U.S.	None
Snowy Egret <u>Leucophoyx thula</u>	Resident	Regional Waterways	Common	Eastern U.S.	None
Common Egret <u>Casmerodius albus</u>	Resident	Regional Swamps and Waterways	Common	Eastern U.S.	None
Green Heron <u>Butorides virescens</u>	Resident	Regional Waterways	Common	Eastern U.S.	None
Black-Crowned Heron <u>Nycticorax nycticorax</u>	Resident	Waterways	Common	Eastern U.S.	None
Yellow-Crowned Heron <u>Nyctanassa violacea</u>	Resident	Swamps Waterways	Common	Eastern U.S.	None
Least Bittern <u>Ixobrychus exilis</u>	Resident	Marsh and Waterways Regionally	Occasional	Mid to Eastern U.S.	None
King Rail <u>Rallus elegans</u>	Resident	Marsh area and Waterways	Uncommon	Mid to Eastern U.S.	None
Louisiana Heron <u>Hydranassa tricolor</u>	Resident	Swamp, Marshes and other water- ways	Occasional	Eastern Seaboard and South- ern U.S.	None

WATERFOWL
1964-1965

Species	Common Name	Scientific Name	Abundance	Season	Range	Notes
Canada Goose	Canada Goose	<i>Branta canadensis</i>	Common	Winter	Canada, U.S., Mexico	
Lesser Canada Goose	Lesser Canada Goose	<i>Branta leucopsis</i>	Common	Winter	Canada, U.S., Mexico	
White Ibis	White Ibis	<i>Eudorcas alba</i>	Common	Winter	Canada, U.S., Mexico	
Wood Ibis	Wood Ibis	<i>Eudorcas alba</i>	Common	Winter	Canada, U.S., Mexico	
Glossy Ibis	Glossy Ibis	<i>Eudorcas alba</i>	Common	Winter	Canada, U.S., Mexico	
Yellowlegs	Yellowlegs	<i>Tringa melanoleuca</i>	Common	Winter	Canada, U.S., Mexico	
Spotted Sandpiper	Spotted Sandpiper	<i>Actitis macularia</i>	Common	Winter	Canada, U.S., Mexico	
Solitary Sandpiper	Solitary Sandpiper	<i>Actitis macularia</i>	Common	Winter	Canada, U.S., Mexico	
Common Snipe	Common Snipe	<i>Centrocercus urophasianus</i>	Common	Winter	Canada, U.S., Mexico	
Ring-billed Gull	Ring-billed Gull	<i>Larus delawarensis</i>	Common	Winter	Canada, U.S., Mexico	
Virginia Rail	Virginia Rail	<i>Spizella monticola</i>	Common	Winter	Canada, U.S., Mexico	
Lesser Scaup	Lesser Scaup	<i>Branta leucopsis</i>	Common	Winter	Canada, U.S., Mexico	
Greater Scaup	Greater Scaup	<i>Branta leucopsis</i>	Common	Winter	Canada, U.S., Mexico	

BIRDS (Cont'd)

<u>Species</u>	<u>Habitat and/or Seasonal Status</u>	<u>Range in Region or State</u>	<u>Abundance In Region</u>	<u>Range In U.S.</u>	<u>Project Impact</u>
Black Tern <u>Chlidonias nigra</u>	Migrant	Regional Marsh	Rare	Eastern U.S.	None
Brown Pelican <u>Pelecanus occi- dentalis</u>	Migrant	Regional Water- ways	Endangered	Southern U.S.	None
Southern Bald Eagle <u>Haliaeetus leucocephalus</u> <u>leucocephalus</u>	Migrant	Regional Oceans, Rivers and Lakes	Endangered	U.S.	None
American Peregrine Falcon <u>Falco peregrinus</u> <u>anatum</u>	Migrant	Regional	Rare	U.S.	None
Red-Cockaded Wood- pecker <u>Dendrocopus borealis</u>	Resident	Regional Pine Woodlands	Uncommon	Southern States	None

MAMMALS

White-Tailed Deer <u>Odocoileus virginianus</u>	Resident Woody Areas	Statewide	Common	U.S.	Mini- mal
Marsh Rabbit <u>Sylvilagus palustris</u>	Resident Coastal Plains	Coastal Plains, Lowlands, Marshes and Floodplain Area	Common	South- east U.S.	Moder- ate
Raccoon <u>Procyon lotor</u>	Resident Various Habitats	Statewide	Common	U.S.	Mini- mal
Opossum <u>Didelphis marsupialis</u>	Resident	Statewide Streams Bottomlands	Abundant	U.S.	Mini- mal
Squirrel <u>Sciurus sp.</u>	Resident	Statewide	Abundant	U.S.	None
River Otter <u>Lutra canadensis</u>	Frequent Resident	Coastal Plains Salt Marshes	Uncommon	East Coast	None

MAMMALS (Cont'd)

<u>Species</u>	<u>Habitat and/or Seasonal Status</u>	<u>Range in Region or State</u>	<u>Abundance In Region</u>	<u>Range In U.S.</u>	<u>Project Impact</u>
Gray Fox <u>Urocyon cinereo- argenteus</u>	Resident	Statewide	Common	South- east U.S.	None
Bobcat <u>Lynx rufus</u>	Resident	Statewide	Occasional	Southern U.S.	None
Mink <u>Mustela vison</u>	Resident	Statewide Streams and Marshes	Common	U.S.	Mini- mal

FISH

Spotted Gar <u>Lepisosteus oculatus</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Blueback Herring <u>Alosa aestivalis</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Hickory Shad <u>Alosa mediocris</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
American Shad <u>Alosa sapidissima</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Atlantic Menhaden <u>Brevoortia tyrannus</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Gizzard Shad <u>Dorosoma cepedianum</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Threadfin Shad <u>Dorosoma petenense</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Bay Anchovy <u>Anchoa mitchilli</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal

FISH (Cont'd)

<u>Species</u>	<u>Habitat and/or Seasonal Status</u>	<u>Range in Region or State</u>	<u>Abundance In Region</u>	<u>Range In U.S.</u>	<u>Project Impact</u>
Golden Shiner <u>Notemigonus cryso-</u> <u>leucas</u>	Resident	Coastal Region	Common	South- east Coast	Mini- mal
Shiner <u>Notropis sp.</u>	Resident	Coastal Region	Common	South- east Coast	Mini- mal
White Catfish <u>Ictalurus catus</u>	Resident	Coastal Region	Common	South- east Coast	Mini- mal
Channel Catfish <u>Ictalurus punctatus</u>	Resident	Regional	Abundant	Southern Region	Moder- ate
American Eel <u>Anguilla rostrata</u>	Resident	Regional	Occasional	Southern Region	Mini- mal
Striped Bass <u>Morone saxatilis</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Dollar Sunfish <u>Lepomis marginatus</u>	Resident	Coastal Region	Common	South- east Coast	Mini- mal
Spotted Sunfish <u>Lepomis punctatus</u>	Resident	Coastal Region	Common	South- east Coast	Mini- mal
Spottail Goby <u>Gobionellus stigma-</u> <u>turus</u>	Resident	Coastal Region	Common	South- east Coast	Mini- mal
Striped Mullet <u>Mugil cephalus</u>	Resident	Coastal Region	Common	South- east	Mini- mal
Bay Whiff <u>Citharichthys spilop-</u> <u>terus</u>	Migrant	Coastal Region	Common	South- east	Mini- mal
Hog Choker <u>Trinectes maculatus</u>	Migrant	Coastal Region	Common	South- east	Mini- mal

TREES

<u>Species</u>	<u>Habitat and/or Seasonal Status</u>	<u>Range in Region or State</u>	<u>Abundance In Region</u>	<u>Range In U.S.</u>	<u>Project Impact</u>
Bald Cypress <u>Taxodium distichum</u>	Resident	Regional Wetlands and Bottomlands	Common	Atlantic and Gulf Coast Plains	Mini- mal
Sweetgum <u>Liquidambar styraciflua</u>	Resident	Regional Bottom- lands	Common	South to South- east U.S.	Mini- mal
Red Maple <u>Acer rubrum</u>	Resident	Regional Swampy Sites and Uplands	Abundant	Mid to Eastern U.S.	Mini- mal
Willow <u>Salix longipes</u>	Resident	Regional Moist Area	Common	Eastern U.S.	Mini- mal
Cattail <u>Typha latifolia</u>	Shallow Waters Close to Mid	Regional Bays, Marshes and Moist Areas	Abundant	U.S.	Mini- mal
Pine <u>Pinus sp.</u>	Resident	Regional Area	Abundant	U.S.	Mini- mal
Hickory <u>Carya sp.</u>	Resident	Regional Area	Common	Eastern U.S.	Mini- mal
Hophornbeam <u>Ostrya virginiana</u>	Resident	Regional Moist Area	Occasional	Eastern U.S.	Mini- mal
Oak <u>Quercus sp.</u>	Resident	Regional Area	Abundant	U.S.	Mini- mal

REPTILES

American Alligator <u>Alligator mississippi- ensis</u>	Resident	Marsh, Swamps and Other Simi- lar Areas	Occasional	South- eastern U.S.	Mini- mal
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2/2

ARMY ENGINEER DISTRICT SAVANNAH GA JAN 76

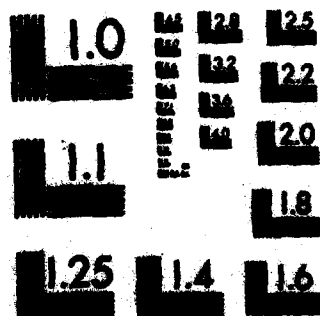
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

ADDITIONAL FISH SPECIES

<u>Species</u>	<u>Habitat and/or Seasonal Status</u>	<u>Range in Region or State</u>	<u>Abundance in Region</u>	<u>Range in U.S.</u>	<u>Project Impact</u>
Sea Trout <u>Cynoscion nebulosus</u>	Resident	Coastal Region	Common	South- east Coast	Mini- mal
Spot <u>Leiostomus xanthurus</u>	Resident	Coastal Region	Common	South- east Coast	Mini- mal
Weakfish <u>Cynoscion regalis</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Croaker <u>Micropogon undulatus</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Cobia <u>Rachycentron canadum</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal
Tripletail <u>Lobotes surinamensis</u>	Migrant	Coastal Region	Common	South- east Coast	Mini- mal

PLANTS

<u>Species</u>	<u>Habitat and/or Seasonal Status</u>	<u>Range in Region or State</u>	<u>Abundance in Region</u>	<u>Range in U.S.</u>	<u>Project Impact</u>
White Waterlilies <u>Nymphaea odorata</u>	Shallow Ponds and Lakes	Throughout Region	Common	Eastern	
Bladderworts <u>Utricularia</u> sp.	Floating Aquatic Plants	Throughout Region	Common	U.S.	Moderate
Pickersweed <u>Pontederia</u> sp.	Shallow Bodies of Water	Coastal Waterway Areas	Common	Southeastern Seaboard of U.S.	Minimal
Water Hyacinth <u>Eichhornia crassipes</u>	Water and Very Moist Areas	Regional Waterways and Moist Areas	Common	South-east States	Minimal
Giant Cutgrass <u>Panicum polyanthemum</u>	Swamps, Marshes, and Shallow Water	Coastal Swamp, Marsh and River	Abundant	South to Southeast U.S.	
Alligatorweed <u>Alternanthera philoxeroides</u>	Water to Dry Field	Various Regional Water and Soil Conditions	Abundant	South-east and Gulf Coast	Minimal
Peltandra <u>Peltandra</u> sp.	Muddy Shores and Shallow Water	Throughout Region	Common	S. Mexico to Gulf of Mexico	Minimal
Sawgrass <u>Cladium jamaicense</u>	Water and Dry Ground	Region Bottom-land and Marshes	Abundant	South-east and Gulf Coast	Minimal
Smooth Cordgrass <u>Spartina alterniflora</u>	Organic Soil	Coastal Marshes Throughout Region	Abundant	Atlantic and Gulf Coast Region	Minimal
Cattail <u>Typha latifolia</u>	Shallow Waters Close to Mud	Regional Lagoons, Marshes and Moist Areas	Abundant	U.S.	Minimal

APPENDIX E
CORRESPONDENCE



UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20530

February 19, 1975

Colonel Edwin C. Keiser
District Engineer - Savannah District
Corps of Engineers
U. S. Department of the Army
P. O. Box 889
Savannah, Georgia 31402

Dear Colonel Keiser:

The draft environmental impact statement "Operation and Maintenance, Savannah Harbor, Georgia," which accompanied your letter of December 26, 1974, has been received by the Department of Commerce for review and comment.

The statement has been reviewed and the following comments are offered for your consideration.

GENERAL COMMENTS

A number of tidal bench marks are located along those portions of the Savannah River covered in the subject document. The marks are shown on the attached Tidal Bench Mark Index Map for Georgia. Also, a number of geodetic control survey monuments are located along the banks of the Savannah River, its associated channels, and in the proposed disposal areas.

If there is any planned activity which will disturb or destroy these monuments, the Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Survey requires not less than 90 days notification in advance of such activity in order to plan their relocation, and we recommend that funding for this project include the cost of any relocation required for such monuments and marks.

The required notification should be addressed to:

Director, National Geodetic Survey
National Ocean Survey, NOAA
U. S. Department of Commerce
WSC # 1, 6010 Executive Blvd.
Rockville, Maryland 20852

SPECIFIC COMMENTS

2.00 ENVIRONMENTAL SETTING WITHOUT THE PROJECT

Page 5, paragraph 2.09. This section would be improved if discussion and data were presented on the sources and amount of sediment being introduced into the harbor area.

4.00 THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

Page 19, paragraph 4.02. Reference is made to research conducted by the Skidaway Institute of Oceanography regarding the effects of dredging on water quality parameters. The results of this study should be provided in the final environmental impact statement, preferably in tabular form.

Page 20, paragraph 4.03. The data provided in Table 4 of this section would be more useful and significant if bottom turbidity measurements were provided for several stations. Suspended materials may flow along the bottom of given water systems without any indication of turbidity near the water's surface.

5.00 ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

Page 22, paragraph 5.03. Biological resources. The draft environmental impact statement states that "Dredging activities will temporarily reduce the benthic and plankton populations located in shoaling areas; however, this reduction will have no significant impact upon the higher organisms of the harbor. Past investigations have shown that benthic organisms destroyed as a result of dredging operations normally repopulate the site two to six months following such dredging." These conclusions should be supported by appropriate data and documentation.

6.00 OPTIONS FOR THE PROPOSED ACTION


Page 23, paragraph 6.01 - 6.02. In planning for the future operation and maintenance of the Savannah Harbor, the statement should consider the possibility of regulating dumping permits in order to reduce or eliminate the amount of sludge released into harbor areas. This policy would have the effect of ameliorating engineering problems related to stresses built up on the containing structures due to the spoil drying process.

As mentioned earlier (comments on paragraph 2.09), the statement should contain a description of sources of sediment to the harbor area. Moreover, the discussion of alternatives to the proposed project should consider the feasibility of reducing the amount of sediment from the various sources.

Finally, the draft environmental impact statement should be expanded to address the potential impact of the proposal on the Savannah Wildlife Refuge and on the Tybee Island beach erosion control efforts.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,


Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Attachment



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
ATLANTA AREA OFFICE
PEACHTREE CENTER BUILDING, 230 PEACHTREE STREET, N.W.
ATLANTA, GEORGIA 30303

REGION IV
Peachtree-Seventh Building
50 Seventh Street, N.E.
Atlanta, Georgia 30323

February 7, 1975

IN REPLY REFER TO:

4.18

Col. Edwin C. Kaiser, District Engineer
Department of the Army
Savannah District Corps of Engineers
Post Office Box 889
Savannah, Georgia 31402

Dear Colonel Kaiser:

Subject: Draft Environmental Impact Statement
Operation and Maintenance
Savannah Harbor, Georgia

We have reviewed your Draft Environmental Impact Statement on the above captioned project and offer the following comments:

1. In general, HUD defers to other agencies with respect to establishing and enforcing air and water quality standards, hydrological standards, fish and wildlife conservation measures and archeological concerns. Since we have no formal jurisdiction in these matters, the absence of comments on the validity of the information regarding these areas contained in your DEIS should not be construed as approval or concurrence.
2. We recommend deleting all references to potential residential development as a future land use for abandoned or discontinued disposal sites since the nature of the fill is unstable and unsuitable for economically feasible residential uses.
3. We also recommend further exploration into the possibility of using the recycling option exclusively or in combination with other alternatives mentioned in your DEIS.

Thank you for giving us the opportunity to review your DEIS. We would appreciate receiving a copy of your final EIS when it is published.

Sincerely,



United States Department of the Interior

OFFICE OF THE SECRETARY

Southeast Region / 148 Cain St., N.E. / Atlanta, Ga. 30303

(ER-74/1583)

FEB 25 1975

District Engineer
U.S. Army Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402

Dear Sir:

As requested in your December 26, 1974, letter to the Assistant Secretary, Program Policy, we have reviewed the draft environmental statement for the Operation and Maintenance of Savannah Harbor, Chatham County, Georgia, project for project effects on national park areas and historic sites, outdoor recreation, hydrology, geology, mineral, and fish and wildlife resources.

We offer the following general comments for your consideration:

The project consists of continuation of dredging and maintenance to the Savannah Harbor and Savannah River. Besides the presently used disposal areas, an additional 4,000 acres will be required in the near future. The statement fails to mention that the spoil areas in the upper harbor area are on the Savannah National Wildlife Refuge; therefore, the deposition of spoil would require careful handling and containment. The area to be dredged is used by several species of anadromous fish, including striped bass, herring, and shad. High turbidity at critical biological times could be very damaging to fish. The impact on minerals should be minimal, as the resources are relatively widespread. Although the statement does not discuss project impact on mineral resources or their availability, we believe it is acceptable. It is also adequate from the standpoint of recreational interests.

The following comments refer to specific portions of the statement:

SUMMARY

3. (B.) Adverse Environmental Impacts

This section lists the various impacts of the project on the environment but fails to mention the effects on anadromous fish migration and spawning. In our opinion, maintenance dredging could damage the migration and spawning of striped bass, herring, and shad and should be mentioned in this discussion.



Archeological and historical sites, page 17, paragraph 2.41

There is no indication in the statement that the State Historic Preservation Officer for the State of Georgia has been consulted. His comments should be included in the final statement.

Page 17, paragraph 2.42

The effects on Fort Jackson as a result of improvements on disposal area 13-A should be discussed.

Page 17, paragraph 2.44

The location of the CSS GEORGIA in relation to dredging operations should be discussed. Until a final determination is made on the eligibility of the relic for nominations to the National Register of Historic Places, it should be considered as eligible. As such, it is the Federal agency's responsibility to discuss steps taken to comply with the Advisory Council on Historic Preservation's "Procedures for Protection of Historic and Cultural Properties" (Federal Register, January 25, 1974), Section 800.

Page 17, paragraph 2.45

The completed archeological survey, recommendations, and final evaluation data should be included in the final statement.

It is the constructing agency's responsibility to determine eligibility of cultural resources found in the area of the project's influence for nomination to the National Register of Historic Places. Criteria for eligibility are provided in Section 800.10.

THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION AND ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

Page 20, table 4

This table deals with dredge turbidity measurements in the Savannah Harbor and displays turbidity measurements made at depths of 3 feet and 10 feet. It would be helpful to have measurements at or near the bottom where turbidity can be quite critical to the fishery.

Aquatic resources, page 21, paragraph 4.07 and Biological resources, page 22, paragraph 5.03

These paragraphs state that recent investigations have shown that benthic communities will return in 2 to 6 months. Our comment is that there are also studies that reveal that some benthic communities destroyed by dredging activities are never completely restored.

OPTIONS TO THE PROPOSED ACTION

Page 23, paragraph 6.00

The statement in this paragraph that new sites or methods will be required within 8 to 10 years appears to contradict the first paragraph under 6.01 which implies present disposal sites are adequate. The discussion of "options for the proposed action" leaves considerable doubt as to what the "proposed action" really is.

Ocean dumping of dredged materials, page 24, paragraph 6.05

The last sentence in this paragraph should be supported by factual evidence, particularly in view of the environmental consequences of using land sites beyond those presently committed.

ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Page 26, paragraph 8.00

We believe the second sentence to be an understatement of fact. We further believe there is no probability that marsh areas with 20 feet of spoil would reestablish themselves as tidal marsh within any reasonable time span.

Thank you for the opportunity to review and comment on this draft statement.

Sincerely yours,



**Miss June Whelan
Special Assistant to the Secretary
Southeast Region**



Joe B. Turner
COMMISSIONER

Charles M. Parrish, III
DIVISION DIRECTOR

Department of Natural Resources

OFFICE OF PLANNING AND RESEARCH
STATE ARCHAEOLOGIST
MARTHA MUNRO HALL
WEST GEORGIA COLLEGE
CARROLLTON, GEORGIA 30117
(404) 834-6836
(404) 836-6321

November 17, 1975

MEMORANDUM

TO: Col. Edwin C. Keiser, District Engineer, Savannah District

FROM: Lewis H. Larson, Jr., State Archaeologist *[Signature]*

SUBJECT: Savannah Corps of Engineers, Draft EIS, Operation and Maintenance of Savannah Harbor, Chatham County, Georgia
CCN: 74-12-30-05

This memorandum is written in response to an inquiry from Mr. DeRigo's office regarding the possibility of an adverse effect on cultural resources within the zone of the project noted above. We note that the project will involve maintenance in existing channels. In view of this, it seems unlikely that this project activity will have an adverse effect on cultural resources within the project area.

LHL/mlr

Included as Response to U.S.D.I.'s comment No. 9.41.



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Region Four
1422 West Peachtree Street-Suite 700
Atlanta, Georgia 30309

January 14, 1975

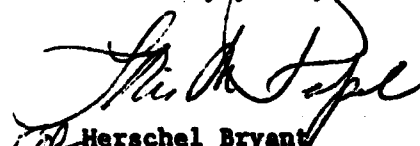
Colonel Edwin C. Kaiser
District Engineer
Corps of Engineers
P. O. Box 889
Savannah, Georgia 31402

Dear Colonel Kaiser:

Your letter of December 26, 1974 to Mr. Harry E. Stark forwarded copies of the Draft Environmental Impact Statement (EIS) for Operation and Maintenance of the Savannah Harbor for review and comments. In accordance with Mr. J. D. Lacy's, Regional Federal Highway Administrator, December 31, 1974 letter to you, we have reviewed the Draft EIS here at the Division level.

According to our review, the proposed project crosses only two Federal Highways, U. S. Routes 17 and 17A. As we understand the project, it will involve the maintenance of the existing channel only, with no new widening and deepening of the channel, in the vicinity of the highway crossings of the Savannah River. Consequently, we have no comments concerning the proposed project; however, we are forwarding a copy of the Draft EIS to the Georgia Department of Transportation for their review and comment.

Sincerely yours,


Herschel Bryant
Division Engineer



**DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD**

Address reply to:
COMMANDER (nsp)
Seventh Coast Guard District
51 SW. 1st Avenue
Miami, Fla. 33130

(305) 350 5276

5922/19

8 January 1975

**Colonel Edwin C. Keiser
District Engineer
Department of the Army
Savannah District, Corps of Engineers
P. O. Box 889
Savannah, GA 31402**

**Re: Draft Environmental Impact Statement
for the Operation and Maintenance
of Savannah Harbor, Georgia**

Dear Sir:

**As requested in your letter of 26 December 1974, the subject EIS has
been reviewed by this office and no conflicts within Coast Guard mission
areas were noted.**

Thank you for this opportunity to register our comments.

Sincerely,

W A Montgomery
W. A. MONTGOMERY

**Captain, U. S. Coast Guard
Chief, Marine Safety Division
By direction of the District Commander**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

**1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309**

FEB 19 1975

**Colonel Edwin C. Keiser
District Engineer
Savannah District, Corps of Engineers
P. O. Box 889
Savannah, Georgia 31402**

Dear Colonel Keiser:

We have reviewed the Draft Environmental Impact Statement for the operation and maintenance of Savannah Harbor and find that we have environmental reservations about some aspects of the project. We also believe certain items in the Statement need correction and expansion to give a proper perspective to the problems involved. For this reason we have assigned a rating of ER- (environmental reservations) to the project and 2 (insufficient information) to the Impact Statement.

A major environmental concern is the high rate of deposition of sediment (7,000,000 cubic yards per year) and the rate at which the removal of this sediment is consuming valuable marshlands with present disposal practices. The marsh areas being consumed are adjacent to the main streams and channels, and that portion of marsh bordering the streams is most valuable to the marine ecosystem, since this interface acts as the feeding ground for fishes, shellfish, crabs, etc., which live on the organisms produced by the marsh environment. Blocking off this portion of the marsh also greatly decreases the value of the remaining interior marshlands.

Since blocking off the marshes by piling sediments along the river channels will eventually funnel most of the sediments to the ocean, we believe that from an environmental standpoint, ocean disposal is the best long-term solution to maintaining Savannah Harbor. A study, however, would be necessary to select an ocean site with optimum environmental advantages since protection of the bathing beaches is an important consideration.

We suggest that the foregoing features of the project be discussed more clearly in the final impact statement.

In addition, we suggest several corrections in regard to the acceptability of sediments for open water disposal so that the Statement agrees with present criteria limitations.

The statement on Page 7, Paragraph 2, appears incorrect and should be clarified. Specifically, Samples 1, 2, 3, and 4 shown in Table 2 exceed EPA criteria for open water disposal. Sample 5 does not exceed the criteria but its location is unknown to us because it is not shown on Figure 2.

Present EPA criteria for open water disposal were established January 11, 1971, and until such time as new criteria are promulgated for interior waters, these criteria are still in effect. However, new criteria have been promulgated for the disposal of dredged materials in ocean waters, and these criteria are contained in the Federal Register dated October 15, 1973. (Volume 38, Number 198, Part II, Environmental Protection Agency, Ocean Dumping, Final Regulations and Criteria.) The rules, regulations, and criteria governing the ocean disposal of dredged material are contained in Section 227.6 through 228.8 of this publication.

We also feel further discussion is needed on the practice of disposing on spoil areas such as disposal area 14, Jones Island, and Oysterbed Island with diking only on the channel side. Spoiling in this manner allows the spoil to permeate the marsh area with the coarser materials building up near the main channel. While it has the advantage of leaving the marsh open on one side, materials are not piled as high, and a greater overall area of marsh is degraded than by piling to a higher elevation as in the diked areas. If ocean disposal is to be used eventually, these areas should be diked completely to preserve as much of the marsh as possible.

We offer these further comments:

1. Section 2.32, Page 15 A more complete discussion of aquatic resources should be provided. No mention is made of the dominant macrobenthic organisms or the ecological role of the tidal marshes. The source of information for the composition of the planktonic community should be cited. Similarly, in Appendix B, the source of information for each biotic group covered in the biological inventories should be given.

2. Section 4.06, Page 21 It would be helpful to know what agency in the proposed program will develop wildlife improvement areas.

3. Section 5.03, Page 22 It is stated: "Past investigations have shown that benthic organisms destroyed as a result of dredging operations normally repopulate the site two to six months following such dredging." We suggest that literature substantiating this statement should be cited, and the evidence should be summarized.

4. Section 2.23 This section should be expanded to indicate the area of waste storage lagoons emitting sulfuric acid vapor and the amount of sulfuric acid emitted per acre. Also, steps for preventing the escape of fugitive dust from temporary and permanent land storage sites of dredged materials should be outlined.

(We would appreciate receiving five copies of the final environmental impact statement when it is available. If we can be of further assistance in any way, please let us know.)

Sincerely,

John C. White, Deputy
for Jack E. Ravan
Regional Administrator

Office of Planning and Budget
Executive Department

James T. McInnes, Jr.
Director

GEORGIA STATE CLEARINGHOUSE MEMORANDUM

TO: Mr. Steven Osvald, Chief *SO*
Permits & Statistical Branch
Savannah District, Corps of Engineers
Post Office Box 889
Savannah, Georgia 31402

FROM: *CMB* Charles H. Badger, Administrator
State Clearinghouse
Office of Planning and Budget

DATE: February 25, 1975

SUBJECT: RESULTS OF STATE-LEVEL REVIEW

Applicant: Savannah Corps of Engineers

Project: Draft EIS - Operation and Maintenance of Savannah Harbor

State Clearinghouse Control Number: 74-12-30-05

The State-level review of the above referenced draft environmental statement has been completed.

Comments:

In accordance with the provisions of the National Environmental Policy Act of 1969, the Georgia Department of Natural Resources offers the following comments for the above referenced statement:

This department continues to be concerned with the planning void inherent in these activities. Adequate attention should be given to potential interrelating projects, both Corps' and other agencies'. If dredged material could be used effectively elsewhere, actual cost/benefit could be improved.

This department can offer no objection to this project if it is carried out in such a manner so as not to violate applicable water quality standards, if the activities do not interfere with other legitimate water uses and if the dredging and spoil disposal is performed in accordance with Water Quality Considerations for Construction and Dredging Operations, revised April 1971, Region IV, Water Quality Office, Federal Facilities Branch, Environmental Protection Agency.

continued on page two

Mr. Steven Osvald
74-12-30-05
Page two

It is also urged that the Corps of Engineers coordinate this project with the Coastal Marshland Protection Section of the Department of Natural Resources, and that sufficient monitoring data be collected during dredging operations to document the effect on water quality.

The following comments are also submitted:

Page 7 - second paragraph, the last sentence regarding data included in Table 2, Page 10, contradicts the recorded data in Table 2.

Data on page 20 is not complete enough for meaningful interpretation. Neither the tide nor the cutterhead depth is recorded.

The draft environmental impact statement has not considered the scenic and aesthetic quality of the river front area. It should be recommended that a visual analysis and visual compatibility study be done to improve the commercial areas adjacent to the city. Also the visual impact will be an important ingredient of any recreational use of the river/harbor.

The following State agencies have been offered the opportunity to review and comment on the project:

Georgia Department of Community Development
Georgia Department of Natural Resources
(inclusive of Historical and Archaeological sections)
Georgia Department of Transportation
Georgia Ports Authority
Office of Planning and Budget, Executive Department

Enclosure: Review comments prepared by the Coastal Area Planning and Development Commission dated January 7, 1975.

cc: Ray Siewert, DNR
Dave Garrity, OPB

Date: January 7, 1975

Department of the Army
Savannah Corps of Engineers
P. O. Box 889
Savannah, GA 31402

Fold

FROM: Name: Lorene Blue
Title: A-95 Review Coordinator
Regional Clearinghouse: Coastal APDC

SUBJECT: PROJECT NOTIFICATION AND REVIEW
Applicant: Savannah Corps of Engineers
Project: Draft EIS, Operation and Maintenance of
Savannah Harbor
State Clearinghouse Control Number: 74-12-30-05
Regional Clearinghouse Staff Contact: Lorene Blue

The Regional Clearinghouse has reviewed the Summary Notification for the above project.

As a result of the review it has been determined that the proposed project is in accord with regional and local plans, programs and objectives as of this date. You should now complete and file your formal application with the appropriate Federal agency(s). A copy of this form must be attached to your application.

If you have any questions, please contact the clearinghouse staff member named above, who will be pleased to assist you.

Comment:

Copy to State Clearinghouse



State of South Carolina

Office of the Governor

JAMES B. EDWARDS
GOVERNOR

February 26, 1975

DIVISION OF ADMINISTRATION
Edgar A. Brown Building
Columbia, South Carolina 29201

District Engineer
U. S. Army Corps of Engineers
P. O. Box 889
Savannah, Georgia 31402

Dear Sir:

The State Clearinghouse has completed its review of the draft environmental impact statement on the Operation and Maintenance, Savannah Harbor Georgia. The following agencies were asked to comment on the draft statement: Department of Health and Environmental Control, Wildlife and Marine Resources Department, State Archeologist, Department of Archives and History, State Development Board, Coastal Zone Management Council, and the S. C. Environmental Coalition.

The main emphasis of the comments center around the spoil disposal areas. Enclosed for your consideration in making the final statement are comments from the Wildlife and Marine Resources Department, the Department of Archives and History, and the Department of Health and Environmental Control. The Water Resources Commission will respond directly to the Corps.

The State Clearinghouse would like to receive four (4) copies of the final environmental impact statement for review. If there are any questions, please let me know.

Sincerely,

Elmer C. Whitten, Jr.
State Clearinghouse

ECWjr:cs
Enclosures (3)



South Carolina

Project Notification & Review System

PROJECT NOTIFICATION REFERRAL

TO: Wildlife and Marine Resources
Post Office Box 167
Columbia, SC 29202

RECEIVED

JAN - 3 1975

S. C. WILDLIFE & MARINE
RESOURCES DEPARTMENT

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development projects and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2944. Please return this form prior to the suspension date to:

State Clearinghouse
Division of Administration
1205 Pendleton Street
Columbia, South Carolina 29201

DIVISION OF
ADMINISTRATION

Signature

Elmer C. Whitten, Jr.

Name

Elmer C. Whitten, Jr.

STATE APPLICATION
IDENTIFIERClearinghouse
Use Only

CONTROL NUMBER

DIST. NO.

1 2447

SUSPENSE DATE
1/23

RESULTS OF AGENCY REVIEW

- ☐ PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
☐ AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
☒ AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

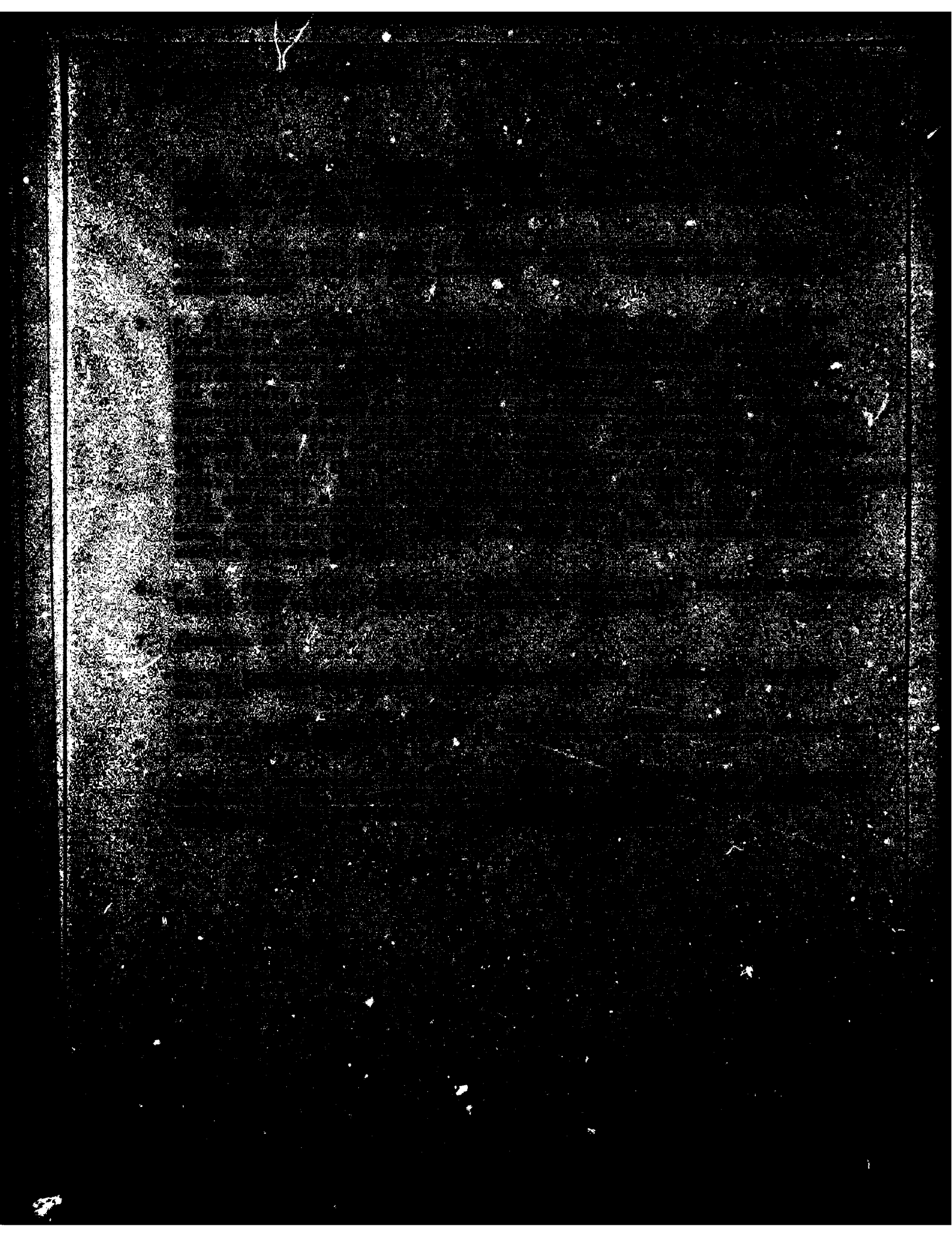
1. Allow no more diking of Spartina alterniflora marshland; do not renew temporary easements which are due to expire.
 - (a) Continue to use existing disposal areas by raising the walls and applying mechanical agitation to reduce volume of existing material confined in diked areas.
 - (b) Continue ocean dumping in EPA approved site until further notice.
 - (c) Seek markets for recycled dredge sediments - construction and industrial products.

2. P. 15, Parag. 2.32 - Aquatic resources.....macroscopia should read macroscopic.

3. P. 15-16, Parag. 2.34 - Shad and Striped Bass are both spring spawners, neither species ascends rivers to spawn in the fall. This section should include a brief description of the spawning season of the Shad, similar to that presented of the Striped Bass.
(Use separate continuation sheets if necessary) (continued)

FOR THE REVIEWING AGENCY:

SIGNATURE: Elmer C. Whitten, Jr.DATE: February 18, 1975TITLE: EXECUTIVE DIRECTORPHONE: 758-6336





SOUTH CAROLINA

Project Notification & Review System

PROJECT NOTIFICATION REFERRAL

TO: Dr. Charles Lee
Dept of Archives and History
Post Office Box 11669
Columbia, SC 29211

JAN 3 1975

S. C. DEPARTMENT OF
ARCHIVES & HISTORYSTATE APPLICATION
IDENTIFIERClearinghouse
Use Only
CONTROL NUMBER
DIST. NO.
1 21017SUSPENSE DATE
1/23

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development projects and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2944. Please return this form prior to the above suspense date to:

State Clearinghouse
Division of Administration
1205 Pendleton Street
Columbia, South Carolina 29201

Signature

Elmer C. Whitten

Name

Elmer C. Whitten, Jr.

RESULTS OF AGENCY REVIEW

- ☐ PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
☐ AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
☒ AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

Several archeological sites, investigated by the U.S.C. Institute of Archeology & Anthropology, could be covered by dredged materials in the proposed disposal areas. The sites are designated 33SA 23, 33JA 24, and 33JA 25. The Institute has worked out an agreement to excavate these sites before spoils are deposited. Neither site has been recommended for the National Register of Historic Places by the Institute. Appropriate Federal Agency official should decide, in consultation with state and local officials, whether section 106 of the National Historic Preservation Act is applicable. (Use separate continuation sheets if necessary)

FOR THE REVIEWING AGENCY
SIGNATURE: Charles E. Lee

DATE: Feb 15, 1975

TITLE: Director

PHONE: 758-5811



South Carolina Project Notification & Review System

PROJECT NOTIFICATION REFERRAL

TO: Mr. S. J. Ulmer
Dept of HEnC
2600 Bull Street
Columbia, SC 29201

STATE APPLICATION
IDENTIFIER

Clearinghouse
Use Only
CONTROL NUMBER

DIST. NO.

11 2007

SUSPENSE DATE
1/23

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development projects and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2944. Please return this form prior to the above suspense date to:

State Clearinghouse
Division of Administration
1205 Pendleton Street
Columbia, South Carolina 29201

Signature

Elmer C. Whitten, Jr.

Name

Elmer C. Whitten, Jr.

RESULTS OF AGENCY REVIEW

- ☐ PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
- ☐ AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
- ☒ AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

Recommend adoption of options 6.03 and 6.04 at earliest practicable moment.

(Use separate continuation sheets if necessary)

FOR THE REVIEWING AGENCY:
SIGNATURE: *R. A. [Signature]*

DATE: 1-27-75

TITLE: Director, OCHP

PHONE: 758-5537

Water Resources Commission



Clair P. Guess, Jr.
Executive Director

March 4, 1975

Colonel Edwin C. Keiser, District Engineer
Department of the Army
Savannah District Corps of Engineers
Post Office Box 889
Savannah, Georgia 31402

Dear Colonel Keiser:

This is in reply to your letter of 26 December, 1974 which transmitted for our review copies of the Draft Environmental Impact Statement on the Operation and Maintenance, Savannah Harbor, Georgia. The Water Resources Commission Staff has reviewed the statement and wishes to provide the following comments in connection with the project.

About 7200 acres of the existing spoil disposal area for the Savannah dredging project are located in South Carolina. This agency is vitally interested in the protection of wetland areas and we urge continued study to find additional spoil disposal methods which will not cause further destruction of valuable wetlands. Recycling of spoil material should be of high priority. Ocean dumping as a spoil disposal method should also be further studied as this certainly appears a viable alternate to direct wetland destruction.

The South Carolina Water Resources Commission appreciates the opportunity of commenting on this environmental impact statement and offers any assistance which we might provide.

Sincerely,

Clair P. Guess, Jr.
Executive Director

CPGJr:rhw



CHATHAM COUNTY-SAVANNAH

METROPOLITAN PLANNING COMMISSION

2 E. MY ST. BOX 1027 SAVANNAH, GA 31402 912-236-9523

HOWARD J. BELLINGER, AIP
EXECUTIVE DIRECTOR

MILTON L. NEWTON, JR.
DEPUTY EXECUTIVE DIRECTOR

January 29, 1975

Mr. Edwin C. Keiser
Colonel, Corps of Engineers
District Engineer
P. O. Box 889
Savannah, Georgia 31402

Dear Mr. Keiser:

Our office has reviewed the Draft Environmental Impact Statement for the Operation and Maintenance, Savannah Harbor, and feel that it accurately assess the potential impact to the environment.

We have concluded from our review that the project will not produce any negative environment influence of concern.

The maintenance of the Savannah Harbor is essential for the well-being of the Savannah-Chatham County area, a large segment of the state's economy.

Please accept this letter as MPC endorsement for the Savannah Harbor Operations and Maintenance Program.

Sincerely,

Howard Bellinger, AIP
Executive Director

HB/cfy

Date: 2/16/76

Department of the Army
Savannah Corps of Engineers
P. O. Box 889
Savannah, Georgia 31402

FROM: Name: Patrice Jackson
Title: A-95 Review Coordinator
Regional Clearinghouse: Coastal APDC

SUBJECT: PROJECT NOTIFICATION AND REVIEW

Applicant: Savannah Corps of Engineers

Project: Final Environmental Statement - Operation
& Maintenance Savannah Harbor, Georgia
State Clearinghouse Control Number: 76-01-26-05

Regional Clearinghouse Staff Contact: Patrice Jackson

The Regional Clearinghouse has reviewed the Summary Notification for the above project.

As a result of the review it has been determined that the proposed project is in accord with regional and local plans, programs and objectives as of this date.

If you have any questions, please contact the clearinghouse staff member named above, who will be pleased to assist you.

Comment:

Copy to State Clearinghouse

State of Georgia
BUREAU OF STATE PLANNING AND COMMUNITY AFFAIRS

Form RC-A95-
May 7
SPD-76-4-1

Rec'd PB 2-16-76

END

DATE
FILMED

1-5

DTIC